THE IRON AGE

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Flexibility Increased by New Foundry

Casting and Ornamental Iron Shop Gives Chicago Company Larger Output and Diversified Outlet for Its Products

DIVERSIFICATION of production is sought by many industries as insurance against wide fluctuations in the volume of business. A modern plant and adequate equipment are conducive to low costs only when fairly steady operations are possible. There is not alone the ever-present danger of idle overhead but also the problem of labor to be considered. In a shop employing skilled craftsmen, intermittent operations are particularly disastrous because they frequently result in the permanent loss of a company's most able employees, making necessary the building up of a new organization, which, at best, is an arduous and slow process.

The construction of a new gray iron foundry and architectural iron shop by the Hansell-Elcock Co., Chicago, has reinforced that company's position from the standpoint of flexibility of output. In the first place, the foundry supplies all the castings required in that organization's structural fabricating shop at Archer and Normal Avenues; secondly, it furnishes much of the material for the new architectural iron shop, which in turn is a logical complement to the structural plant; finally, the foundry does a wide variety of contract work. Hence, it may be classed as both a manufacturing and jobbing foundry.

Located at 3153 South California Avenue, Chicago, the new plant is bounded on the south by the Chicago drainage canal, on the rear by Campbell Avenue, and on the north by the Illinois Central Railroad, from which it is served by a siding. The foundry is 340 ft. long and the main molding bay is 56 ft. wide. Included in a 30-ft. side bay is a molding bay, 30 x 80 ft., a core room, 30 x 100 ft., a cupola house, 30 x 40 ft., and a sand storage room, 30 x 20 ft. On the other side of the main bay is a department for small molding work, 60 x 120 ft., together with a carpenter shop, 30 x 60 ft.; a pattern shop, 30 x 100 ft.; a cleaning room, 50 x 60 ft.; the plant office, 20 x 25 ft., and a boiler and compressor room. A detached fire-proof building, 21 x 100 ft., is used for pattern storage. The available floor space for molding purposes alone totals 28,600 sq. ft.

The buildings were designed with an eye to ventilation and a maximum of natural illumination. Crane runways for the main bay are supported on steel columns which also carry steel trusses supporting a V-shaped roof. A concrete base course extends from the

THOMAS SMITH, who collaborated with a staff member of THE IRON AGE *in the preparation of this article, is believed to be the oldest active foundryman in Chicago, if not in the entire country. Hale and hearty at 76 years of age, he has spent nearly 60 years of his life in the foundry. "In my younger days," he said, "I used to look forward to retirement, but now that I have actually reached the evening of life, I find that the best way to keep well and happy is to remain active in my vocation." Born in England on July 6, 1848, Mr. Smith came to Chicago at the early age of seven years. As a boy of 16 he went to work with the N. S. Bouton Union Foundry Works at Clark, Fifteenth and Dearborn Streets, Chicago. He remained with that organization as long as it occupied that location, or until 1881. The company was then moved to Pullman, Ill., and consolidated with a car wheel plant there under the name of the Union Foundry & Pullman Car Wheel Works. He served that company until 1883, when he became identified with the Dearborn Foundry Co., 1525 South Dearborn Street, Chicago. He was superintendent of the Dearborn foundry for 33 years, until February, 1916. In June, 1916, he became associated with his present employers, the Hansell-Elcock Co., at Normal and Archer Avenues, Chicago. Mr. Smith's experience covers every department of the foundry. He has worked in the molding-room, in the cupola-house, in the core-room, in the pattern-shop, in the cleaning and chipping room, and in the drafting-room. He has also done some structural erection work, having helped erect iron work for the Rock Island Arsenal years ago. At present he is engaged in general utility work for the Hansell-Elcock Co., making estimates for both ornamental and structural iron work, preparing designs for ornamental work, and performing other miscellaneous duties for which his long experience so well fits him.*

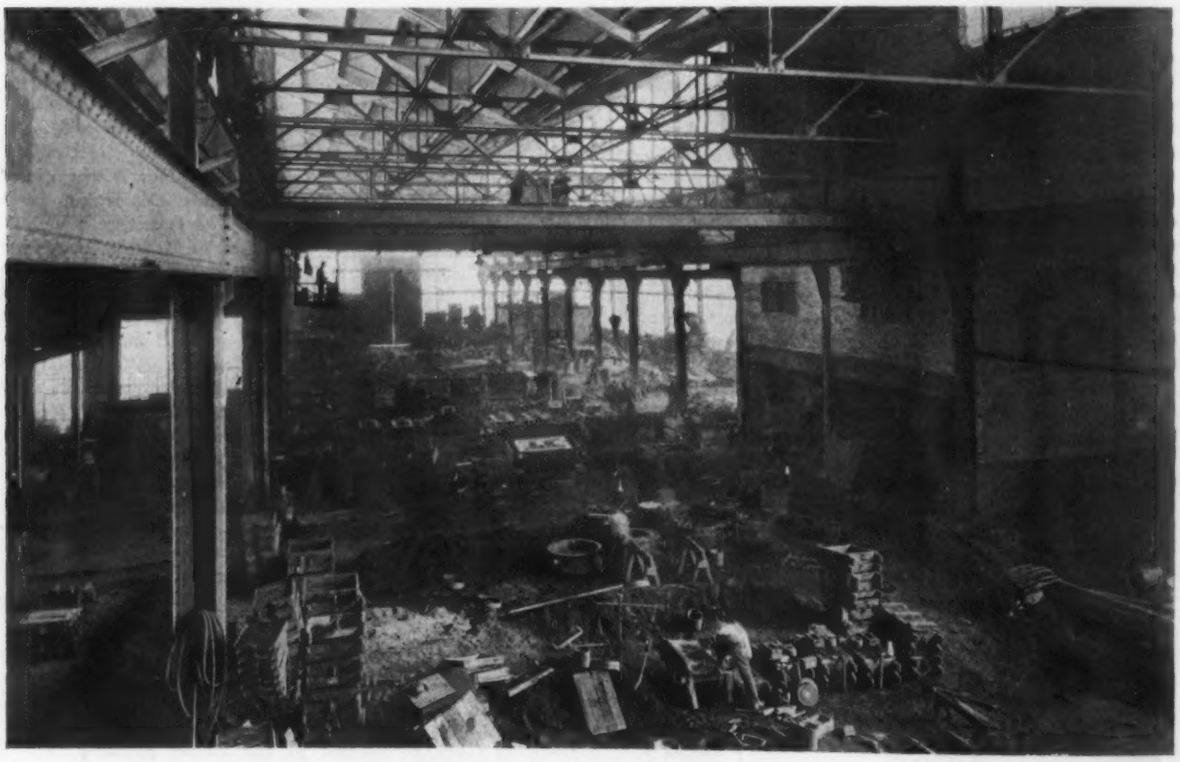
footings to a height of six feet from the floors. Above the course reaching from column to column are Fenestra steel sash frames. A row of tilted sash was installed above the crane runways for ventilating purposes.

On the crane runways, which extend the entire length of the main molding bay, are mounted two electric traveling cranes, one of 10-ton and the other of 5-ton capacity. These facilitate the handling of bulky and heavy work. For many of the large and heavy castings a large pit in the main bay is utilized. Some of the heavier work is also handled on a Norcross jolting machine, made by the Arcade Mfg. Co., Freeport, Ill. The jolter is firmly anchored in a heavy concrete foundation, 4 ft. thick and 12 ft. square, and it has a table, 60 x 90 in., which will take a flask up to 6 ft. 10 in. x 8 ft. 6 in. and 32 in. deep.

Two narrow-gage ladle tracks connect the cupolas with the various molding floors, one track running lengthwise of the main molding bay and the other extending crosswise into the department devoted to small molding work. In that section, one molding floor is of concrete and is served by a portable air-operated roll-over jolt machine. The remainder of the department is devoted to small floor work and bench work; it also has several portable hand squeezers equipped with electric riddles. Floor work is also handled in the molding bay, 30 x 80 ft., adjoining the core room and served by a common overhead hand-power crane.

The cupola house is located at a point with a maximum of ladle travel to the various molding floors. It has been placed directly opposite the bay devoted to small molding work and is situated approximately midway along one side of the main molding bay. There are two cupolas, one 72 in. and the other 48 in. in diameter, with a combined melting capacity of approximately 40 tons in three hours. They are separately served by a No. 5 P. H. & F. M. Roots Co. and a No. 7 B. F. Sturtevant & Co. blower, both of them with individual motor drive. The cupolas are charged with end-delivery buggies. A supply of coke is kept on the charging floor but pig iron and scrap are stored in a yard, served by narrow-gage industrial track. After buggies have been loaded with metal in the yard, the charges are weighed on a 7500-lb. Fairbanks scale and then raised by elevator to the charging floor.

Owing to the great variety of work undertaken by the foundry, a large number of flasks, many of them of considerable size, are stored in the yard. A locomotive crane is used to bring large flasks into the plant as well as to take large castings out of the foundry when ready for shipment. The crane is also utilized for handling pig iron, scrap and sand and for loading cars for shipment. Raw materials for both the foundry and the finishing shop are delivered on the railroad siding which runs parallel to both buildings and adjacent to the canal. To facilitate the handling of materials in and out of the plant the locomotive crane may be run into the main molding bay and for this purpose tracks enter the structure at both ends. For weighing shipments as well as receipts of material, a 55-ft. 150-ton Fairbanks railroad track scale has been placed in the yard. For receipts of materials and deliveries of finished products by automobile truck or team, a 20-ton platform scale has been provided, the beam being located in the office of the plant.



The Main Molding Bay Is 340 Ft. Long and Is Served by Two Electric Traveling Cranes. Approximately midway on the right is the cupola house, and directly opposite the cupolas, on the extreme left is a department for small molding work, reached by a narrow-gage ladle track

The core-baking facilities, like the remainder of the equipment in the plant, are designed to handle work in a wide range of sizes. There are two core ovens, 12 x 24 ft. x 12 ft. high, and underneath each is a heating tunnel, 4 ft. wide x 4 ft. deep. These pits are oil-fired, being equipped with burners furnished by Tate-Jones & Co., Pittsburgh. Core-oven cars are rolled into the ovens on standard-gage tracks. The cars are of a special design developed by the company itself to take care of the wide variety in the size and shape of the cores required. Six notched standards are arranged along the sides of the car so that by laying rails between the notches at any convenient height desired and then extending the rails, channels or plates crosswise between the rails, support is afforded for cores of different shapes and depths.

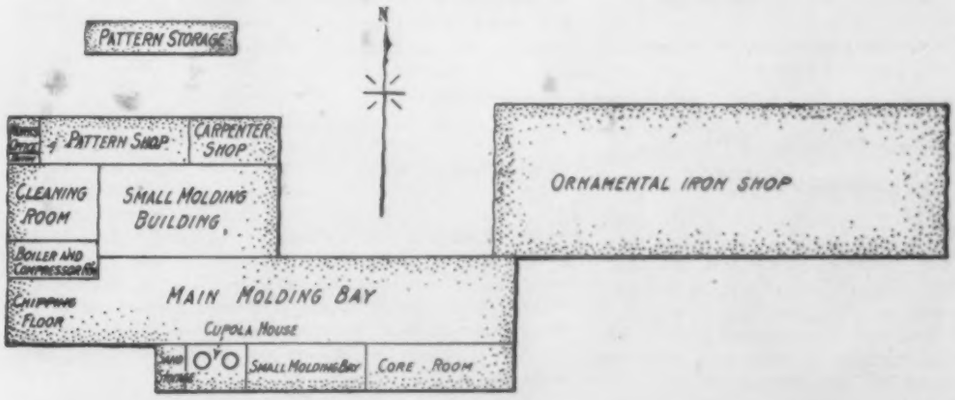
The versatility of the foundry force is constantly being exercised. It must be ready to undertake a wide range of work extending from light and ornamental castings at one extreme to heavy rolling mill or machine castings at the other. In one illustration is shown the cope, pattern and drag for a highly ornamental, ¼-in. plate which forms part of one of five sets of cast iron frames and window sprandles constructed for the St. Luke's Hospital, Chicago. The ornamental part of the pattern is made of wax and the remainder is a wood frame.

The making of the wax part of the pattern is worthy of comment. A model is first made from modeling clay and around it is poured plaster of paris. The latter, when it sets, forms the mold into which the wax is poured. To give the pattern a solid bearing during ramming and to prevent the wax part of it from getting out of shape, it is placed on a plaster of paris bedding. Patterns are brought to the molding floors from the pattern shop on the narrow-gage industrial track previously referred to.

A chipping floor, equipped with pneumatic chipping hammers, is situated at one end of the main molding bay next to the compresser room. The cleaning department, which is equipped with two tumbling mills and emery grinding machines, adjoins the small molding bay.

The architectural and ornamental iron shop, also of daylight construction, is 100 x 300 ft., and connects with the foundry at one corner of the main molding bay. Adjacent to the doorway connecting the two buildings is a material storage where rods, plates, channels, sheets and other materials, required in the ornamental shop, are conveniently arranged on racks.

A SPECIAL Design of Core Oven Car Was Developed to Handle Work in a Wide Range of Sizes. The notched standards permit loading cores of many shapes and depths. The core ovens are to be noted in the background



SKETCH of Plan View of Plant, Showing Arrangements of Different Departments

THE Cope, Pattern and Drag for a Highly Ornamental Plate Forming Part of a Cast Iron Window Frame and Sprandle. The pattern is made of wax on a wood frame. To give the pattern a solid bearing during ramming, it is placed on a plaster of paris bedding. The wax part of the pattern is made by pouring melted wax into a plaster of paris mold which, in turn, was formed by pouring around a model made from modeling clay

This department is commanded by a 10-ton hand-power crane, which also serves a section of the shop devoted to laying out heavy work. Material handling in the remainder of the shop is taken care of by an overhead monorail system.

Among the heavier pieces of equipment in the shop are two Dreis & Krump bending brakes, a guillotine shear with capacity to cut plates up to ¼ in. thick, a radial swing grinder, several punches and shears, drilling machines, engine lathes and miscellaneous machine shop equipment. There is also a blacksmith shop. An electric arc-welding machine is used for spot welding many parts together which formerly were riveted. For example, the tops of coke, sand or grain chutes are now made by welding together the frame members at the corners, whereas formerly the members had to be joined together by straps which were riveted to each of the four sides of the frame. In this, as well as in many other cases, welding has saved both time and material. Pneumatic grinding machines are used for grinding the welds.

A job which was in process at the time of writing was the assembling of five sets of cast iron window frames and sprandles, 10 ft. 7 in. wide x 21 ft. high. These were constructed entirely of ¼-in. cast iron plates bolted together, with the exception of steel brackets at the bottom and the top for fastening the frame to the masonry. Accuracy in the assembly was required so that the frames would fit tightly into the masonry. The work was complicated somewhat by the fact that the top of the frame was in the shape of a half circle.

The success of the ornamental shop, of course, is measured to a large extent by its ability to handle a variety of work economically. Step plates with three treads, for example, are bent out of one piece. Stair stringers are frequently made out of steel channels, but latterly there has been an increasing demand for rounded corners and, for that reason, channel stringers are being bent from steel plates. Stair horses made out of steel angles are bolted to the stringers, whereupon step plates are bolted to the horses. Railings, banisters, ornamental doors and gratings are among other typical jobs handled.

At one end of the ornamental shop on a mezzanine floor is a large and well-lighted drafting room with vault, blue printing machine and other necessary equipment.

A hot-blast system of heating is used in both the ornamental shop and the foundry. The hot blast heaters were supplied by Skinner Brothers Mfg. Co., Inc., St. Louis, while oil burners were furnished by Tate-Jones & Co., Inc., Pittsburgh. The same oil system which supplies fuel for the heaters also serves the core ovens. Oil is stored in two underground tanks filled from railroad tank cars. It makes a complete circuit from the tanks to the extreme end of the ornamental shop, then to an oil reservoir and back to the storage tanks. An underground trench extending through the plant carries the oil service, as well as compressed air and electric conduits. In the summer season the fans of the hot blast heaters may be used for ventilating purposes. Ventilation is also promoted by windows in the continuous sash and by large rolling lift doors located at various points in the walls of the foundry and architectural shop.

Employees May Become Owners of Pittsburgh Steel Foundry Co.

It will be possible for employees of the Pittsburgh Steel Foundry Co., Pittsburgh, with a plant at Glassport, Pa., to acquire a substantial interest in the business under a plan of reorganization just announced which means the formation of a new company called the Pittsburgh Steel Foundry Corporation and a recasting of the financial structure. The old company was capitalized at $1,500,000, all common stock. The new company has a capital consisting of $750,000 25-year, 6 per cent first mortgage bonds, $750,000 of 5 per cent cumulative preferred stock and 30,000 shares of no par value common stock.

A substantial part of the common stock has been placed in escrow with the Union National Bank, Pittsburgh, which is available for subscription by employees during the next 10 years, the price for the first year being $20 a share and advancing $1 per share per year until the last year of the offer, which means a maximum price of $29 a share. With a sinking fund provided for the retirement of the bonds and provision made for the retirement of the preferred stock, there is a possibility that the employees, provided they take the common stock offered, eventually will come into control of the company. The management of the new company will be the same as that which directed the old one. It comprises Stewart Johnston, James H. Lockhart, F. A. McCune, C. McK. Lynch, G. A. Hassel, J. M. Lockhart, Lloyd Smith, H. Darlington, Jr., Thomas Lynch and C. W. Howat.

Walworth Mfg. Co. Report

The Walworth Mfg. Co., Boston, showed gross profits in 1924 of $3,673,578, which compares with $4,903,848 for 1923, $3,323,788 for 1922 and $1,482,693 for 1921. Depreciation in each of those years averaged better than $350,000, in 1924 being $379,600. Deducting depreciation, interest charges, tax reserves and dividends from last year's earnings left a surplus of $30,724, which compares with one of $1,102,968 for 1923 and $445,480 for 1922. In 1921 there was a deficit of nearly $1,233,000. At the close of 1924 current assets were $7,744,119, including $638,346 cash. Current liabilities were $2,291,866, of which notes payable amounted to $1,110,000. This year was one of keen competition and unusual price cutting, said President Coonley, in his remarks to stockholders. Starting with a fair volume of forward orders in the spring, incoming business declined steadily in tonnage until after election, when there was a substantial recovery, but not in prices. The most important step in production during the year was the development of a line of electric steel valves and fittings for high-pressure work.

Shipment of Locomotives

WASHINGTON, March 9.—February shipments of locomotives numbered 85, according to Department of Commerce reports. Twelve of these were for export. Except for the figures of last April, this total is the smallest in more than two years. It compares with 90 in January and with 99 in February a year ago. In February, two years ago, the total was 207.

Unfilled orders at the end of February were 397, of which 54 were for export. This is close to the average of the previous six months. At the end of February, 1924, the number on order was 499, while one year previous it was 2220.

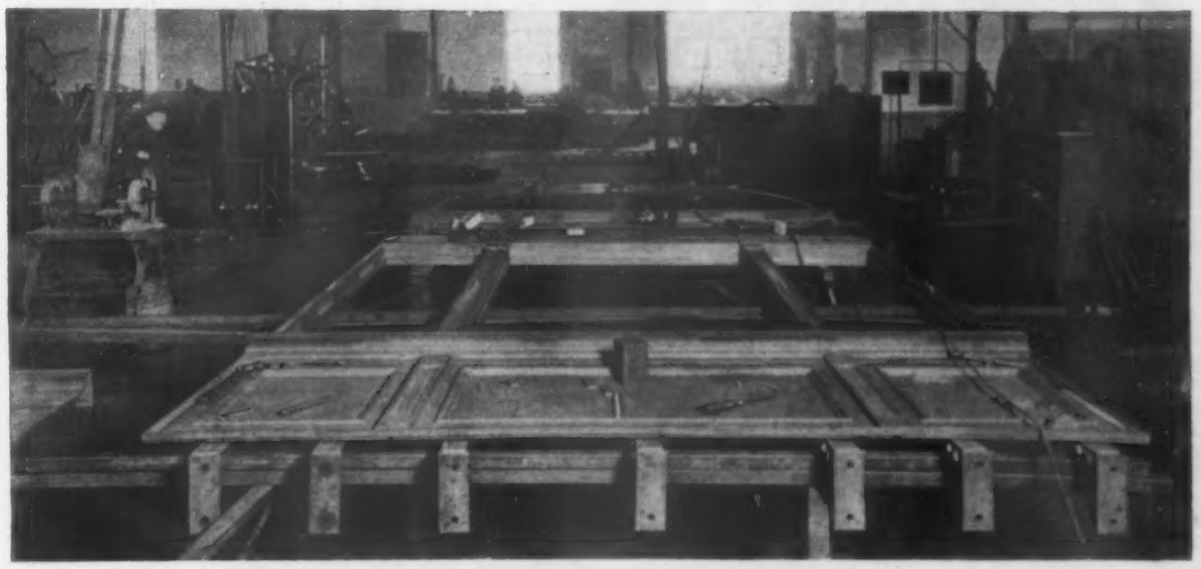
Steel Construction Institute Meetings

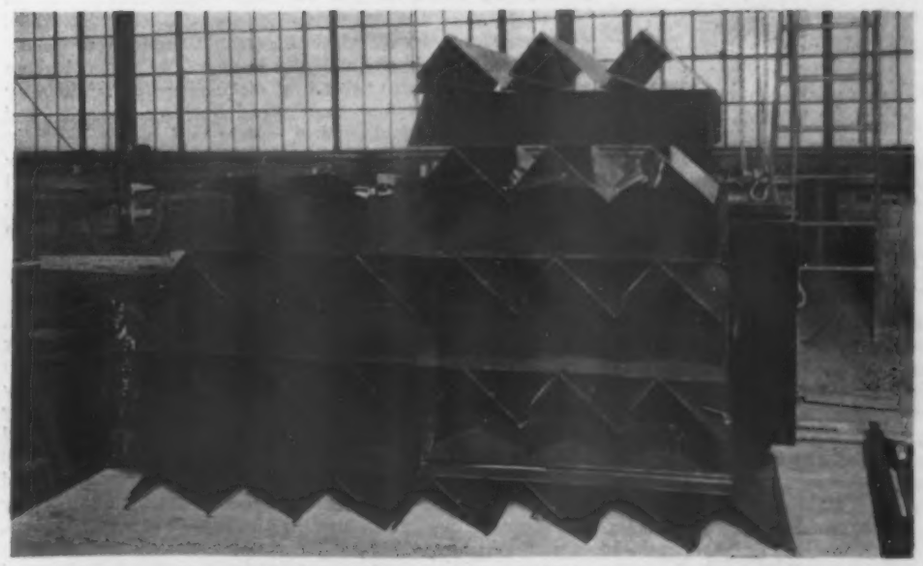
The American Institute of Steel Construction, 350 Madison Avenue, New York, is conducting a series of district meetings in various cities of the country under the supervision of its chief engineer, Lee H. Miller. The purpose of the meetings is to educate architects, engineers, builders, real estate operators, financiers, steel fabricators and others as to design, fabrication and erection of structural steel and to develop a better understanding of its use.

The first meetings were held last week and this week, beginning with one at Atlanta, Ga., on March 6, the second at New Orleans on March 9 and the third at Dallas, Texas, on March 11. Other meetings to come are: El Paso, Texas, March 14; Los Angeles, March 19; San Francisco, March 23 (tentative); Portland, Ore., March 30; Seattle, Wash., March 31; Vancouver, B. C., April (tentative); Winnipeg, Man., April 6 (tentative); Madison, Wis., April 20.

Products of the Hansell-Elcock Co. in Ornamental Iron Field

STAIR Stringers, Formerly Made Out of Steel Channels, Are Now Frequently Universal Steel Plates to Supply a Demand for Rounded, Smooth Edges. A stringer of the latter type is in the foreground. Stair horses, made out of steel angles, are bolted to the stringers





ACAST Iron Window Frame, (Above) 10 Ft. 7 In. Wide by 21 Ft. High, in Process of Assembly. Construction is entirely of ¼-in. cast iron plates bolted together, except for steel brackets at the bottom and the top for fastening into the masonry

STEP Plates With Three Treads Are Formed Out of One Piece

BENDING HARD STEEL BARS

Strength Shown by Rail Steel-Concrete Bars After Bending—Specifications for Tests

BY E. E. HUGHES*

RAIL steel reinforcing bars repeatedly have shown their ability to stand up under bending tests. There has been in some quarters an impression that a bend in a hard steel, or rail steel, bar greatly reduced the strength of the material at the point of the bend. Thousands of tests have disproved this.

In a series of experiments, carried out some months ago, pieces were picked at random from scrap heaps consisting of crop ends of longer bars. These pieces were subjected to tests, not in a laboratory, but on a machine that was used regularly for bending bars for commercial use. They were bent in accordance with standard specifications for hard grade billet and rail steel bars. After bending they were subjected to tests in a specially designed apparatus.

Eighty per cent of the bars broke in the straight part, leaving the bend intact. The remaining 20 per cent broke in the bend but, on an average, at only 4.15 per cent less than the tensile strength of duplicate straight bars from the same batch of samples. What is more important, however, is the fact that not one single bar broke below 80,000 lb. per sq. in., the minimum tensile strength of hard grade steel, while the average shows the bars to have broken at 24 per cent higher than this figure.

Under conditions of service, in which the bar is completely surrounded by concrete, bends in rail steel should develop 100 per cent of their original strength. Obviously, bends do not weaken rail steel bars. It should be borne in mind that difficulties experienced in bending rail steel bars are exactly the same as those found in bending hard grade billet stock. This is because the steel is of high tensile strength.

*President Rail Steel Products Association.

How the Bend Should Be Mad.

Tensile and ductile properties are always inversely proportioned; if one is high the other is low. Rail steel bars should be sent slowly, so that the proper flow of the particles may take place. Also, unskilled labor should not be used for this work. Sometimes 1-in. bars are bent around the same pin that is used for bending ⅜-in. bars. No reinforcing bar, regardless of the grade, should be subjected to such treatment.

Specifications as to the size of the mandrel and the number of degrees through which the bars should be bent without breaking have been laid down by the American Society for Testing Materials, as follows:

Hard Steel and Rail Bars

Cold Bend Without Fracture	Bend	Mandrel
Bars under ¾ in. diameter or thickness	180 deg.	$d=4t$
Bars ¾ in. diameter or thickness or over	90 deg.	$d=4t$

t—size of the bar.
d—diameter of mandrel around which bend is made.

In good engineering practice, bending for construction is done around pins of 7 or 8 diameters, which favors the steel to a considerable extent. No difficulty should be experienced if bending is properly done. It is obvious that the bar should not be expected to stand severer treatment than is exacted by the test in the specification.

Whether the steel be hard, intermediate or soft, improper bending develops excessive strains. Why should the strength of a reinforcing bar be sacrificed to gain ductility, simply that the bar may be mistreated in bending? Bending departments are adjuncts of practically all rail steel mills and skilled labor is employed to bend bars to specifications, at a nominal charge. Skilled workers rarely have difficulty in the bending of hard grade bars.

Dinner and Smoker of New York Steel Treaters

The annual dinner and smoker of the New York Chapter of the American Society for Steel Treating will be held in the banquet room at the Fraternities Building, 22 East Thirty-eighth Street, New York, on Wednesday, March 18, at 6.30 p. m. W. S. Bidle, the national president, and W. H. Eisenman, the national secretary, will be guests of honor, as will also A. M. Bird, the national vice-president. The meeting will be enlivened by vaudeville stunts and other features.

The spring sectional meeting of the National Society will be held at Schenectady, N. Y., March 28, 29 and 30 under the auspices of the Schenectady Chapter.

Cincinnati Metal Trades Association Elects Officers

E. A. Muller, vice-president and general manager of the King Machine Tool Co., Cincinnati, was elected president of the Cincinnati Metal Trades Association at the annual meeting of the organization on March 2 at the Cincinnati Business Men's Club. Other officers elected were: David C. Jones, the Lunkenheimer Co., vice-president; James E. Mills, the Smith & Mills Co., secretary; and L. G. Freeman, the Louis G. Freeman Co., treasurer. Members elected to the executive committee of the association were J. B. Doane, American Tool Works Co.; J. Wallace Carrel, Lodge & Shipley Co.; and A. B. Breeze, Cincinnati Ball Crank Co.

Attendance at the meeting, which was preceded by a dinner, was the largest in the history of the association, more than 300 members being present. Chester A. Dyer, member of the executive committee of the Ohio Farm Federation, spoke on lower taxes and less legislation. Dr. G. W. Dyer, in his address, pointed out the economic fallacies temporarily interfering with the operation of the law of supply and demand. Homer D. Sayre, commissioner of the National Metal Trades Association, Chicago, outlined the activities of the Industrial Education Department and emphasized the importance of adequate training of apprentices, specialists and foremen.

Michigan Safety Conference

A Michigan State Safety Conference will be held at Grand Rapids, Mich., Monday and Tuesday, March 23 and 24, under the joint auspices of the Safety Councils of Grand Rapids, Bay City, Detroit, Lansing, Battle Creek, Jackson and Flint, together with the Grand Rapids Engineering Society, Grand Rapids Association of Commerce, and numerous other organizations. H. M. Taliaferro of the American Seating Co., Grand Rapids, is general chairman of arrangements committee. Meetings will be held at the Hotel Pantlind. Fire protection will be the general subject of discussion at the morning meeting of the first day; wood-working hazards and hazards in plants handling metals will be discussed in the afternoon session; accident prevention problems in the public utility and paper and pulp industries will be discussed at the morning meeting of the second day and the afternoon meeting will be devoted to discussion of public and school safety.

A safety conference will be held at Newark, N. J., Monday, March 16, under the auspices of the Jersey City Safety Council, Newark Safety Council, Paterson Safety Council and the American Society of Safety Engineers—Engineering Section, National Safety Council. Morning and afternoon sessions will be held in the auditorium of the Public Service Corporation, 80 Park Place, Newark, and a dinner meeting will be held in the evening. Subjects to be discussed include factory fire protection, plant design and housekeeping methods, illumination for safety and production, industrial ventilation, and thinking safety in terms of industrial management.

Selecting and Placing College Graduates*

First Essential Is Knowing Why You Want a College Man —Much Depends on His Ability to Study—Aptitudes Important—Why Turnover Is High

BY JOHN MILLS

IN discussing the problems of selecting and placing the college graduate in business we cannot pass over the question of "Why do we want a college graduate in business?"

Do we want to employ a college graduate because of certain technical ability in economics, accounting, writing, science or engineering, which he has acquired from his college courses and of which we may make immediate use? There may be differences in the reply to this question, but for myself I hope that the reply is "no." The college should not be a trade school for industry and all attempts to make it such by the inclusion of courses of specific industrial applicability are likely to destroy its value in our social and economic life. Are we, on the other hand, in the employment market for college men because everybody else is and we assume we are all on the right track? I think there is an element of this, and that there is a danger of neglecting to develop, by educational opportunities within industry, the man of equal native ability who cannot attend college.

ARE you looking for men with trained brains and pleasing personality, who may make creative contributions to your business and in a sufficient number of cases develop into capable executives?

If so, have you in mind definite and comprehensive specifications for such a man and have you developed a method for determining whether he is sufficiently within the limits of these specifications to warrant employment? Have you set up a method for determining the applicant's aptitudes and mental foundations to produce in the line of his chief interests?

A highly intelligent and definite method of procedure in the selection and placing of college graduates in business is outlined in Mr. Mills' paper, which may be read with profit by those employing either few or many college men.

Are we, to form another question, interested in college men because of a greater adaptability and ease of training for many of the routine and repetitive tasks of our business? Of such a demand in the past there has been too much. It usually reflects the absence of adequate training facilities for less immediately acceptable employees.

Having answered these questions, we shall probably agree that we turn to the colleges in the hopes of obtaining men of good mental ability and personality, who have acquired habits of thought and study which will enable them to see broadly the business and technical problems of the future, to analyze the factors involved, to arrive objectively and without prejudice at solutions, and through personality and executive ability to give those solutions weight and effectiveness. We look for trained brains, in vigorous bodies, with pleasant but dynamic personalities, men who may make creative contributions to our respective businesses or arts, and in a sufficient number of cases develop as capable executives. If this is what we are looking for in employing the college man, then we are in a position to write tentative specifications for such a man.

Habit of Study Important in Man-Specifications

I believe in writing specifications for the man and not specifications for the job. I am entirely willing that for the more routine tasks of industry, job specifications shall be written, but when it comes to employing in the hope of obtaining the future creative genius or far-reaching executive, we must work to man specifications. The specifications proposed are six in number.

The first is that of intellectual curiosity. Under this term I do not include casual and idle curiosity, but that sort which leads to a continued and orderly effort to determine the why of the physical or social phenomena of the world about one. The second requirement is the ability to study. It is perhaps the one real aim in education; but the percentage of the population which has the ability to study is much less than the percentage of academic degrees or similar evidences of learning would appear to indicate. Learning looks to the past while study looks to the future. It is this ability to apply one's mind and acquire knowledge by one's own efforts which the college man, that we want in industry, must have acquired. The third requirement is the habit of study. Apparently this is a habit which takes time to acquire and the four years of college have frequently proved insufficient time.

The three remaining specifications have to do with the student's attitude and abilities in human relationships. The fourth requirement is, therefore, the ability to learn from men. The fifth is the ability to cooperate with men, and the sixth the promise of ability to lead and influence men. The ability to learn from men is the most important, and, if inherent in an applicant for employment, must in time lead to an ability to cooperate with men on a basis of trust and confidence which will provide opportunities for leadership.

Determining Whether Applicant Is Up to Specifications

Having established the specifications we must next set up a method for determining whether or not the applicant is sufficiently within the limits of the specification to warrant employment. There is no proven or accepted method for so measuring men. I cannot myself place very much reliance upon the so-called psychological tests in their present stage of development. Nor do I believe that it is necessary to attempt a mental test of the conventional sort for men who have been successfully subjected to the intellectual discipline of our American colleges. I place some weight upon the grades obtained by the student in his academic courses, but do not demand of him a uniformly high grade. What I am interested in detecting is some course of study which at some time has sufficiently aroused his curiosity to stimulate some real intellectual effort.

In the selection of a candidate for employment there are three questions to be answered: 1, along what lines of endeavor lie his fundamental interests and urges? that is, what are his aptitudes? 2, has he the mental foundation to produce in this line? and 3, has he the personality, character and physical qualifications for such productive work? The placement of an

*Abstracted from a paper presented at the annual convention of the American Management Association, held in New York. Mr. Mills is with the Bell Telephone Laboratories, 463 West Street, New York.

applicant who is employed is, of course, determined by the answers to these same questions, and is usually more successful if the employee is placed in work along the lines of his natural aptitudes.

In selecting men I am myself inclined to the interview method, although I recognize its obvious limitations. In such interviews the greater part of the effort is expended in arriving at an answer to the first question, the applicant's aptitudes. The answers to the remaining two questions are by-products; that is, judgments formed largely during the answering of the first question. This interview method [outlined at length in Mr. Mills' paper], which arrives by free association of ideas at something from which the interviewer can make a judgment, is the method in which I have greatest faith for determining whether or not an applicant has the intellectual curiosity, and the ability and habit of study, which are half of the six man specifications. It also provides opportunities for judging the last three of the specifications.

Method of Determining Aptitudes

We all know how applicants tend to have acquired certain individual prejudices as to types of work and express preferences which are misleading and usually inadequately representative of their own interests. In an attempt to get below the surface of these somewhat conventional preferences, I have been using for technical school graduates a method which was recently described in the *Journal of Personal Research* under the title, "Engineering Aptitudes." The method involves asking the applicant some four definite questions with, of course, such supplementary ones as the conversation may later require. These force him to express in abstract terms his more or less instinctive interests.

The first question assumes that the applicant is looking for a job which will lead to a career, that is to the expression of his personality through some medium. For this let us assume four media, namely, those of (1) ideas, (2) men, (3) things, and (4) economic symbols. The philosopher has his career almost entirely in the medium of ideas, a politician in that of men, a mechanic in the field of things, and a statistical economist in that of economic symbols. But there are combinations of these fields with primary and secondary interests; thus a good teacher is usually interested in ideas and men; a business promoter in men and economic symbols; a research scientist in ideas and things. It is illuminating to have each applicant write these four media in his order of relative interests. We usually find the salesman or business-manager type expressing his preference in the order of men, economic symbols, things, and ideas. The type to be concerned with the management of technical processes expresses his interest as men, things, ideas and economic symbols, or as things, men, ideas and economic symbols, if he will take more interest in the equipment than in the human beings with the management of which he is concerned. Your advertising man, personnel worker, and the like, will be in favor of the order: men, ideas, things, economic relations. Cross check questions may be used to supplement this question. They serve also to lead to somewhat finer differentiations.

Another question asks as to the applicant's preference between technical responsibility and supervisory responsibility, assuring him that both types are equally rewarded, in salary and opportunity of promotion for similar contributions to the welfare of the company. The men who put ideas high in their list will express an instinctive tendency toward technical responsibility and those who should not be placed in jobs calling for the development of technical judgment will choose supervisory responsibility.

A further question has to do with motive. We assume that as human beings we are driven to make such successes as we do by virtue of three motives, namely, an economic motive, which is the desire for more and more of the things of this world, a motive of ambition, which is interested primarily in acclaim and credit, and an instinct of workmanship, which is the play instinct grown up, a motive which finds its satisfaction in the activity itself, and at the time, rather than in results which follow. We may then ask what the applicant estimates are the relative proportions of these three urges in his own make-up. The management type runs high, apparently, in the motive of personal ambition, somewhat less in economic motive, and very little in the instinct of workmanship. Those who tend to become technical experts in industry are usually high in their instinct of workmanship, next in ambition, and least in economic motive.

Selection and placement are steps which precede training and development; and one phase of this broader problem is of immediate interest. There is a large turnover during the first two years' employment after graduation which means a considerable waste for industry and for the individual. Even assuming correct analysis in the original selection and placement such waste may still occur and the fact that it does is a serious failure on the part of both industry and the college graduate.

THERE is an explanation for the restlessness and apparent impatience of the college man who is new in business. It is not that he is unwilling to undergo the hard training required or that he expects to be made a general manager within the first year. The main cause of dissatisfaction, which leads in the first year or two to severance of employment, is inherent in the college training, and the better that training, the greater may be the dissatisfaction. The matter is discussed at length by Mr. Mills, who states that the failure of the college man to grow intellectually during his early years in business and the failure of business to provide for such development constitute the most serious failure in connection with the introduction of college men to industry.

Impatience of College Men Explained

There is an explanation for the restlessness and apparent impatience of the college man who is receiving his introduction to industry, which is not the conventional one that he is unwilling to undergo the hard training which business requires or that he expects to be made a general manager within the first year. Such attitudes may be symptoms but one main cause of the restlessness and dissatisfaction which leads in the first year or two to severance of employment, voluntary or otherwise, is inherent in the college training and the better that training the greater may be the dissatisfaction.

During his junior and senior year the college man studies courses in economics, psychology, philosophy, or science and mathematics, which require of him, as a rule, severe mental effort. He has been working on a high intellectual level. Then he enters the world of business and industry and the things which, for the first year or two, at least, he must learn are matters of organization routine, locations, familiarity with stocks, lists of customers, methods of accounting, and the like, all matters which can be learned by a man of high school education or even less. In general, he has no task which is on as high an intellectual level as that on which he has been working in college. He has important information to acquire, but very little of the

SIDE GUIDE AND GRIPPER

thinking, which is required of him, is of the same difficulty and continuity. Can we always blame him if he develops impatience and feels that the tasks on which he is engaged are below his mental abilities?

The worst of the situation is that he comes unconsciously to the conclusion that business and industry do not demand continued effort on a high intellectual level as did his college work. Of course, he is given no task of this level until he has acquired the background of company experience and informational knowledge. The result, in general, is that his habit of study is interrupted, never to be regained, and that is why in the man specifications previously stated insistence has been placed upon the habit of study.

Only the man who has the habit of study will, as a rule, ride through the early years of his industrial connection without a permanent lowering of the possible level of his intellectual effort. The result of such a lowering is that when, in the course of advancement because of his business acumen, human adaptability, and experience, the college graduate reaches finally a position where he is confronted with problems demanding intensive study on a high intellectual level, he is out of the habit of study. Then he is incapable of adequately attacking these problems; and instead of obtaining the solutions by scientific methods, he is guided by hunches, by so-called business judgment, and by conscious or unconscious imitations of the practices and methods of others.

The failure of the college man to continue to grow intellectually during his early years in business, and the failure of business to provide facilities for such development, are, I believe, the most serious failure in connection with college men in business.

Would Annul Order of Commission

Ford Motor Co. and Others Assert Action in Assigned Car Case Was Not Legal—Appeal to a Kentucky Court

WASHINGTON, MARCH 10.—Applications continue to be filed seeking to set aside and annul the order of the Interstate Commerce Commission in the assigned car case. The Ford Motor Co. and the Fordson Coal Co. have made application to the three-judge statutory court in the eastern district of Kentucky at Covington. These interests asked to have the order set aside so that it will not interfere with the operation of mines of the coal company in Pike County, Kentucky, and the plant of the motor company in Detroit. April 11 has been set as the date for the hearing which will be held at Covington. Like applications of steel companies and others affected by the order, the Ford bill points out the necessity for a special kind of coal at a particular time to be made into coke for use in the Ford steel plant being established in Michigan.

The bill states that the company has invested nearly $2,000,000 in coal cars for serving the mills. It is charged in the application that the order of the commission, which went into effect on March 1, exceeds the power of the commission. The claim is made that Congress did not confer the jurisdiction taken by the commission. It is stated that the commerce clause of the constitution is not intended to regulate commerce but is intended to prohibit commerce when such prohibition is not in any way in the interest of the public. It is also charged that the attempted exercise of power by the commission is not warranted by either the interstate act or the transportation act.

Moreover, it is claimed that the order, which provides for pro rata distribution of coal cars by railroads at mines during periods of emergency, regardless of the number of cars that may be privately owned by industrial concerns, does not prevent discrimination but rather tends to increase it. Because of this, it is claimed that the order defeats its own implied purpose of abolishing discrimination.

Suits of a similar character also have been filed in Philadelphia by the Rainey-Wood Coke Co., the Seaboard By-product Coke Co., the Chicago By-product Coke Co., and the Donner-Hanna Coke Corporation in a joint bill of complaint. In another bill suit has been filed by the Berwind-White Coal Mining Co., the Westmoreland Coal Co., and the New River & Pocahontas Coal & Coke Co. The declaration is made in the Rainey-Wood bill that enforcement of the order would abolish the right of the companies to use private cars in times of coal shortage. This, it is claimed, would constitute a denial of rights of laws enacted by Congress and the State of Pennsylvania, as well as those guaranteed by the constitution. The first bill was filed by the Bethlehem Steel interests.

Boston Branch of National Metal Trades Association Reelects Officers

Wolcott Remington, Thomson Electric Welding Co., Lynn, Mass., was reelected president of the Boston branch of the National Metal Trades Association at the annual meeting held Wednesday evening, March 4, at Young's Hotel, Boston. Other officers reelected were J. R. Kinney, Kinney Mfg. Co., Jamaica Plain, Boston, vice-president; and W. S. Kemp, Holtzer-Cabot Electric Co., Jamaica Plain, treasurer.

H. K. Spencer, Blanchard Machine Co., Cambridge, Mass., and F. J. Shepard, Lewis Shepard Co., South Boston, machinery, succeed B. T. Williston, Manning, Maxwell & Moore, Inc., Boston, and J. J. Lannon, Grant Gear Works, South Boston, as members of the executive committee. L. H. Sturtevant, Sturtevant Mill Co., Boston, whose term expires this year, was reelected a member of that committee. The other members are Theodore W. Little, Walworth Mfg. Co., Boston; Thomas Officer, Sullivan Machinery Co., Claremont, N. H., and Gordon Russell, James Russell Boiler Works, Dorchester, Boston.

Guests of the evening included Paul C. De Wolf, Brown & Sharpe Mfg. Co., Providence, R. I., president National Metal Trades Association, who spoke on the activities of the association, and Dr. Gus W. Dyer, who talked on the American theory of industry. Mr. Remington acted as toastmaster. The report of C. H. Wilson, secretary of the Boston branch, showed the organization to be in a flourishing and prosperous condition.

Passing of the Factory Clock Key

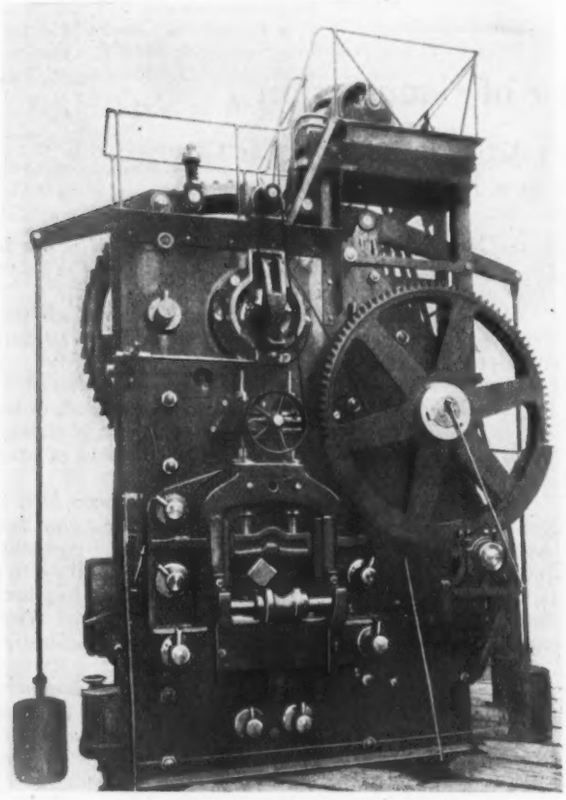
The passing of the clock key in industrial plants has been shown by an analysis of sales and inquiries of the Brown Instrument Co., Philadelphia, according to J. P. Goheen, secretary of the company. Some statistical genius, he says, once figured that it was costing him $210 a year to wind the various clock-driven contrivances in his plant. When he started to check up on how much it cost him when somebody forgot to wind them, he issued a rush order to replace every clock-mechanism with electric drive wherever possible.

For quite some time recording instruments—pyrometers, thermometers, resistance thermometers, pressure gages, tachometers and CO_2 meters—have been supplied with a synchronous motor clock, where alternating current is available. Where only direct current is used, the instruments are usually operated off an impulse time clock system.

Large Plate Frame Billet Shear

What is believed to be the largest motor and gear-driven heavy duty steel plate frame billet shear ever built is that shown in the accompanying illustration. This shear, which was built by Henry Pels & Co., 90 West Street, New York, is designed to cut 9 in. rounds, 8 in. squares and 4⅛ x 20 in. flats, cold. The shearing is accomplished in one stroke. The machine is capable of six strokes a minute, the length of the stroke being 7⅞ in.

The shear is driven by a 100-hp. motor, which is mounted on a platform at the top of the machine as shown, and is belted to the flywheel from which the power is transmitted by countershaft, eccentric shaft and plunger to the ram carrying the knife. The ram is engaged for each stroke by throwing a hand-operated clutch, which disengages automatically at its highest position after the cut is made.



Steel Plate Frame Billet Shear for Cutting 9-In. Rounds and 8-In. Squares. The shearing is in one stroke

The end of the bar remaining after the cut is made is held by a hold-down, which is actuated by a separate motor, which in turn is belted to the elevating mechanism. This motor is arranged to stop automatically when the hold-down comes in contact with the bar to be sheared, stopping, also, when the hold-down reaches its highest position.

The strain of cutting is taken by the frame, which is made up of two heavy armor plates, specially heat-treated. Automatic lubrication is provided for the larger bearings. The flywheel, which weighs 5 tons, is made of cast steel to withstand the centrifugal force set up at its periphery. The large gear weighs 9 tons and the teeth of this gear are 3½ in. thick. The upper knife weighs 550 lb. The machine is set in a pit and accessory equipment for handling the billets is available. The height of the machine to the upper edge of the frame is 15 ft., and to the highest rail, approximately 21 ft.

Teaching Safety to New Employees

Teaching Safety to New Employees is the title of an illustrated safe practice pamphlet recently published by the National Safety Council, 168 North Michigan Avenue, Chicago. The pamphlet is non-technical and represents the combined experience of industrial members of the council. It has been edited by 75 safety engineers who form a volunteer committee for such work.

"One of the most important considerations of industrial management is the introduction of new employees into the plant," reads the introduction. Statistics indicate that a new employee is more liable to injury than one who has been long in the service. Mechanical safeguards, to a certain extent, prevent accidents, but in most cases they occur from causes which are not preventable by guards. Education and supervision are the only effective methods for preventing such accidents.

Proposed Tariffs Cancelled

WASHINGTON, MARCH, 10.—The Interstate Commerce Commission has held as not justified proposed modification of tariffs by inclusion of a provision making applicable the minimum weights of the Western classification in connection with commodities moving on the minimum class rate scale to the Western classification. As a result, the commission has ordered the proposed tariffs cancelled. There were many protests made against the tariff, among them being that of the Western Pipe & Steel Co. It was sought in the tariffs by the carriers serving California points and other points in the Pacific Coast territory, to put the modification into effect, as a result of which there would be increased charges in many cases.

Slight Improvement in Employment

HARRISBURG, March 9.—Conditions in the iron and steel industries of Pennsylvania now are slightly better than they were two weeks ago, according to the semi-monthly labor report to R. H. Lansburgh, Secretary of Labor and Industry.

Pittsburgh finds its mills and foundries operating on a relatively good basis. Harrisburg has found that the expected slump has failed to materialize as far as conditions in its territory are concerned. Men are being added rather than dropped in the Philadelphia district. Encouragement is seen in Philadelphia because the Baldwin Locomotive Works is now employing men after having dropped 15,000 employees 18 months ago. Orders have been received for templet makers and structural fitters from the McClintic-Marshall Co. at Pottstown, coppersmiths and marine machinists from the Sun Shipbuilding Co. at Chester, molders and core-makers from the Bethlehem Steel Co. at Bethlehem, die makers and tool makers from the Westinghouse Electric & Manufacturing Co. at Lester.

Officials of the Ford Motor Co., Detroit, have formed a subsidiary under the name of the Ford Motor Co. of Japan, Ltd. Plans are under way for a new assembling and parts plant at Yokohama, Japan, reported to cost close to $500,000, with machinery. Parts for assembling service will be sent from the company's Eastern plant at Kearny, N. J. The company has completed the construction of a new unit at its River Rouge plant, totaling about 525,400 sq. ft., to be given over to assembling of motors for Ford cars. The plant will operate on a schedule of 9000 completed motors per day, in two 8-hr. shifts.

In the article under the title of "Tank Pressure Controlled Automatically," which appeared in THE IRON AGE of Feb. 19, page 571, the entire equipment was stated erroneously to be of Cutler-Hammer Mfg. Co., Milwaukee, design. The switch marked *A*, shown at the left in the illustration accompanying that article, is the Square D safety switch of the Square D Co., Detroit.

Four-Way Drilling Machine Drills 54 Holes

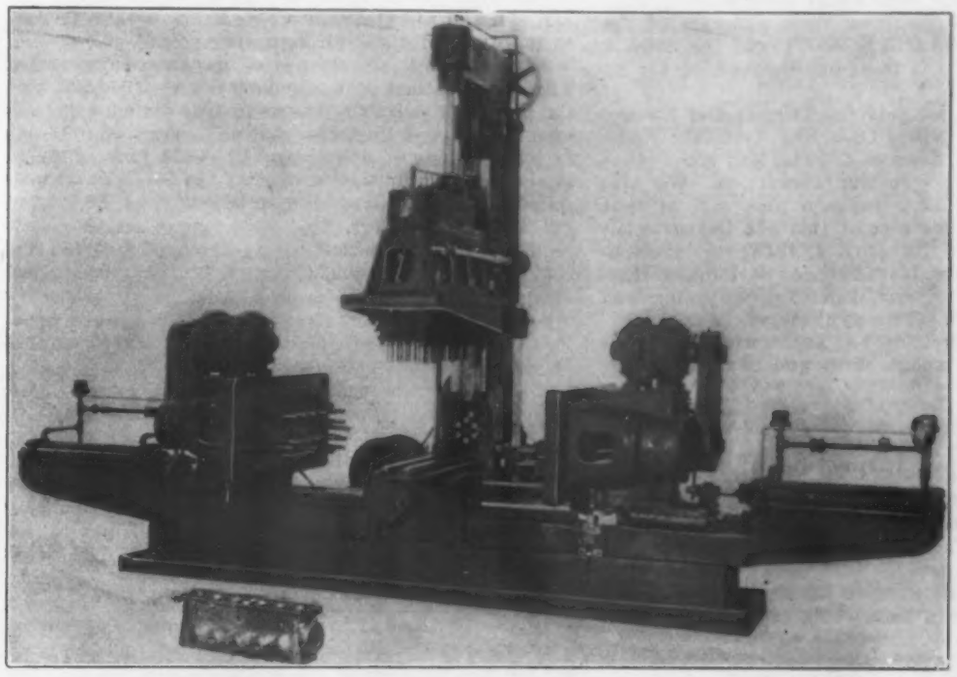
A four-way semi-automatic horizontal and vertical drilling machine used by the Wilson Foundry & Machine Co., Pontiac, Mich., for drilling 54 holes simultaneously in cylinder blocks of Willys-Knight automobile engines is pictured in the accompanying cut.

The base of the machine, which was built by the Fox Machine Co., Jackson, Mich., is a heavily ribbed casting carrying vertical and horizontal columns and provided with an oil trough at the bottom. There are four drill heads, two of which are horizontal, one vertical, and one an auxiliary horizontal head with fixed spindle centers. The total number of spindles available is 68, the left-hand horizontal head having ten, the right-hand horizontal head 23, the vertical head 28, and the auxiliary head seven. The two main horizontal heads are 10x32 in., and have spindles 1⅛ in. in diameter which run at 800 r.p.m. The vertical head is also 10x32 in. but its spindles are 1⅜ in. in diameter, running at 540 r.p.m. The spindles of the auxiliary head are 1⅜ in. in diameter and run at 800 r.p.m. The spindles of the three main heads are driven by means of the company's patented universal joints mounted on patented cluster plates.

The heads are motor driven. The left-hand horizontal head is driven by chain from a 10-hp. motor, the right-hand head by chain from a 5-hp. motor and the vertical head by belt from a 15-hp. motor. The speed of these motors is 1200 r.p.m. The auxiliary head is driven by chain from the 15-hp. motor.

The feed to the heads is taken from Oilgear hydraulic transmission, consisting of a pump mounted at the rear of the vertical column, which furnishes the pressure for actuating the cylinders mounted horizontally at each end of the base. The piston rods of these cylinders are connected directly to the horizontal heads, which in turn transmit feed motion by racks and pinions to the vertical head and also to the auxiliary head at the base. All heads move simultaneously with the same variations. Each head has independent adjustment and any one of them may be disconnected from the train. Oil pressure is controlled by a valve at the front of the machine directly under the right-hand head. Moving the valve lever into its lowest position causes the heads to advance to the work to be drilled at the rate of 90 in. per min. When the drilling position is reached the rate of traverse is reduced automatically to 2 in. per min. which is the drilling feed. After drilling to a predetermined depth the head reverses automatically, traveling at the rate of 90 in. per min. to the starting or rest position completing one cycle.

Lubrication of the machine is by forced feed, oil being circulated to all heads.



There Are Four Drilling Heads, All Motor Driven. The feed to the heads is taken from oilgear hydraulic transmission, which actuates the horizontal heads, which in turn transmit feed motion by racks and pinions to the vertical head and also to the auxiliary head. The heads advance to the drilling position at the rate of 90 in. per min.; automatically drill at 2 in. per min., and return at 90 in. per min.

Will Revise Specifications for Tubular Steel Poles

In recent years thousands of tubular steel poles have been erected annually. About 1500 different poles, ranging in length from 22 to 40 ft. and in weight from 170 to about 3000 lb., are manufactured by a single company, this being cited as indicating the possibilities for simplification and standardization in this field.

Action toward this end has been started by the organization of a sectional committee under the procedure of the American Engineering Standards Committee, and the sponsorship of the American Electric Railway Association to revise the association's specifications for steel poles.

The scope for the project includes specifications covering methods of manufacture, selection of materials, dimensions and weights and their tolerances, inspection and testing, for tubular steel poles used in electric line construction. The sectional committee contains representatives of the American Electric Railway Association, the American Society of Civil Engineers, the National Tube Co., the American Society of Municipal Improvements, the National Electric Light Association, the Independent Telephone Association, the American Welding Society, and of manufacturers.

At the first meeting of the sectional committee F. N. Speller and Ralph H. Rice were appointed to serve as a sub-committee to bring in recommendations for deflection tests and to prepare tentative outline specifications. The sub-committee was requested to give careful consideration to the desirability of publishing a selected list of sizes of tubular steel poles, the minimum number consistent with requirements of the industry.

Twenty-four oil burning locomotives on the Sedalia (Mo.) division of the Missouri-Kansas-Texas Railway will be converted into coal burners. The advance in the price of oil and the relatively lower price of coal are given as the reason for the change. The Sedalia division comprises 160 miles of main line.

REPORT BY PRESIDENT CAMPBELL

Reviews Progress of Youngstown Sheet & Tube Co. and Speaks of Plans

"All indications at present point to more stable conditions during the next four years than have existed for some time past," President James A. Campbell of the Youngstown Sheet & Tube Co. said, in his annual message to stockholders. "We were able to effect economies which would not have been possible under more prosperous conditions. Operations demonstrated that your company was able, even under adverse conditions, to earn fixed charges resulting from purchase of the properties of the Brier Hill Steel Co. and the Steel & Tube Co. of America, and in addition something for its stockholders.

"During the year, we sold the Thomas and Empire sheet mill plants at Niles, Ohio, the Tri-State Engineering Co. plant at Zanesville, Ohio, and some other properties not valuable in our operations. We also changed the location of a lapweld pipe mill at that plant and rebuilt it, the cost of this one improvement being over $1,000,000. By April 1, 1925, we expect to complete a new 700-ton blast furnace at Indiana Harbor, with extensions of our docks for unloading and storage of ore and limestone at these works.

"Your board of directors has authorized the installation of a new continuous skelp and bar mill at the Indiana Harbor plant. Erection of a new seamless tube mill has also been authorized. The cost of these extensions is expected to be about $4,000,000. In the near future, your board of directors will be asked to authorize the building of a tin plate plant and a sheet mill plant at Indiana Harbor.

"When these extensions are completed we believe that our plants at East Youngstown, Brier Hill and Indiana Harbor will be rounded out, their capacity enlarged, their production more diversified and the facilities now enjoyed by your company for economical manufacture and distribution of its products still further increased, so as to offset to some extent disadvantages to our Youngstown plants arising from the recent ruling of the Federal Trade Commission with reference to the use of Pittsburgh as basing point."

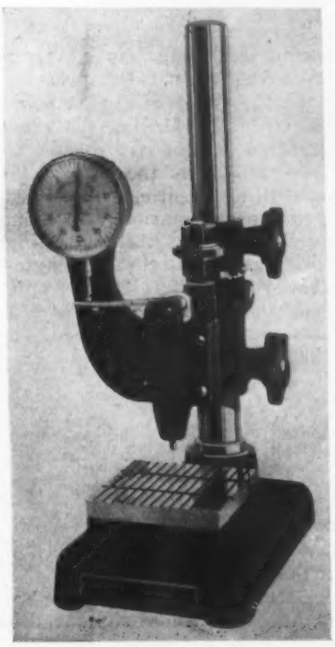
Shipments of all classes of products aggregated 2,286,684 tons last year, comparing with 2,946,779 tons the preceding year. Shipments in 1924 included 309,028 tons of iron and zinc ores, coal and coke; 598,071 tons of pig iron, ingots and scrap; 1,253,004 tons of rolled steel and other finished products; 126,581 tons of miscellaneous materials and by-products, and 26,174,740 gal. of benzol and tar.

The company reported gross receipts of $121,456,370, compared with $165,649,369 in 1923. The 1924 payroll dropped to $37,085,736 from $43,154,814 in 1923. Inventories of materials, semi-finished and finished products were $48,637,681 at the close of 1924, against $53,643,262 a year previous.

Gage for Rapid Inspection of Parts

A gage for the rapid inspection of duplicate parts up to 6 in. in diameter has been brought out by the Active Machine & Tool Co., 1220 West Sixth Street, Cleveland.

As shown in the illustration the device is made up of a table mounted on a base which supports a column on which a dial indicator and its operating mechanism are carried. A hardened, ground and lapped spindle or gaging point above the table actuates a lever arm at its upper end, the opposite end of this arm actuating in turn the indicator spindle in a ratio of 10 to 1. The gage checks work to within 0.0001 in. For 0.0001 in. variation in the piece being checked the pointer on the dial moves ¼ in.



For Each 0.0001 In. Variation in the Work Being Checked, the Pointer on the Dial Moves ¼ In. Thus the variations in size are amplified, permitting rapid inspection. Various auxiliary fixtures are available to facilitate checking of parts which cannot be placed directly on the table

To set the gage for comparative readings the two hand screws holding the gage on the columns are loosened and the gaging point is set at approximately the right distance above the table. Then a Johansson or other gage is placed between the gaging point and the table and close adjustment is made with the knurled nut in front of the column. Then the lower hand screw is tightened, holding the instrument in proper adjustment. The dial which is movable is then turned slightly to set the pointer at zero. The variation in dimension is shown on the dial by placing the work between the gaging point and the table.

The gaging table is 3⅝ x 3½ in., and the distance from the center of the table to the column is 3 9/16 in. A V-block attachment that fits into the slotted gaging table is provided for the inspection of cylindrical and parallel pieces. A wrist pin attachment is also available, this being used for three simultaneous inspections, parallel, cylindrical and diameter.

Exports of bituminous coal from the United States during January fell to 979,600 gross tons, compared with 1,090,486 tons in December and with 1,057,639 tons in January, 1924. Of the total in the current January, 710,886 tons went to Canada, a considerably smaller amount than usual, and overseas exports totaled 268,714 tons, against 358,883 tons in December. In the seven elapsed months of the fiscal year, exports amounted to 9,115,042 tons, compared with 11,041,944 tons in the same seven months of the preceding year.

The Empire Rolling Mill Co., Cleveland, is dismantling its puddling plant and muck bar mill. This company discontinued the manufacture of bar iron four years ago. The plant, which was built 25 years ago, included four single puddling furnaces, six single bushveling furnaces, a 10-in. Belgian and a 16-in. bar mill. The remainder of the plant, which is housed in separate buildings and is now under operation, includes six sheet mills, four cold mills and a galvanizing plant.

The plant of the Covert Gear Co., manufacturer of automobile parts, at Lockport, N. Y., has been sold in a mortgage foreclosure sale to Alwin A. Gloetzner of Lockport, former president and general manager of the concern and later the trustee for the receiver. The sale was conducted by Thomas H. Penney, Jr., assistant U. S. district attorney, acting as special master for the receiver. The plant was sold for $36,000 subject to liens totalling $103,000.

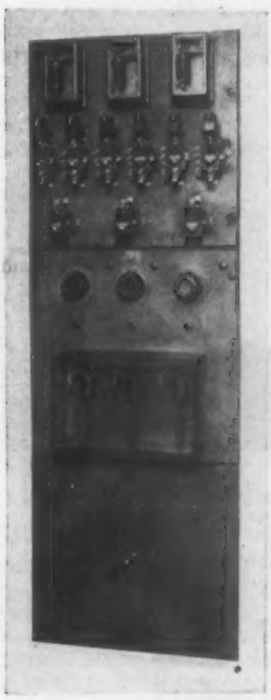
CLOSER ELECTRODE CONTROL

New Automatic Device for Electric Arc Furnaces Insuring More Flexibility

BY H. R. CRAGO AND J. A. SEEDE*

ARC furnaces are used for many purposes, the small sizes principally for melting metals, and the large sizes for smelting and melting various materials in making ferroalloys, abrasives, calcium carbide and similar products. The number of electrodes varies from one to three in the majority of furnaces, but more may be, and have been, used as conditions necessitate.

The electrodes normally operate in a vertical position, the current arcing from the bottom end to the charge or bath, but there are a number of small melting furnaces fitted with two horizontal electrodes, the arc being drawn between the ends of the opposing electrodes. These electrodes vary considerably in size,



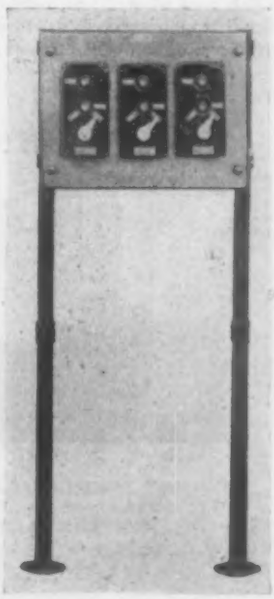


Fig. 1 (Left)—Typical Three-Electrode Panel. Fig. 2—The Auxiliary or Operator's Panel for Two or More Electrodes

the minimum limit in a furnace of commercial capacity being diameters of 2 or 3 in., while in large furnaces 24-in. diameter electrodes are common and 30-in. diameter and larger have been used. Rectangular electrodes of even greater area are in common use, each type of electrode having its advocates; and this holds true for the different materials, carbon and graphite, used in their manufacture.

Regardless of the size and kind of electrode or furnace, some means must be used to maintain the arc length constant within narrow limits, thus obtaining constant power input and balancing the load on the various phases. This requires an equipment that is responsive to small current changes and able to control the comparatively rapid movement of a heavy mass to a new position and stop it in a small fraction of an inch. In addition, the apparatus must be simple, easy to operate and keep in repair, long lived and able to withstand considerable abuse without affecting its accuracy.

The previous type of General Electric electrode regulator proved successful in meeting these requirements, and even better results are expected with the new type now on the market. This new line includes three types of regulator which are for use with one, two and three-electrode furnaces and for which an auxiliary control panel is required. A special single-electrode panel is also included in this line, combining the main and auxiliary control panel.

Fig. 1 is a typical three-electrode panel. At the top of the upper section are the under-voltage relays which cut out automatic lowering when the arc voltage drops below 25 volts and restore it when the voltage reaches 30 volts or above. Directly below these are the raising, lowering and slow or speed control contactors whose names describe their functions.

At the bottom of the center section are mounted the contact-making ammeters which operate the "raise" and "lower" contactors, according to furnace conditions. Directly above these are the rheostats used to vary the calibration of the contact-making ammeters and, therefore, the current and power taken by the furnace. On the lower panel is mounted the handle of the motor circuit disconnecting switch. On single-electrode panels a combination transfer switch and push-button station is also mounted but, on equipments for controlling two or more electrodes, the push-buttons are mounted on a separate panel, called the auxiliary or operator's panel. Such a panel is shown in Fig. 2.

The new design of automatic electrode control embodies all the desirable features of the old type in addition to several new features which are incorporated to make the control closer and more flexible, also to make the operation simpler from the standpoint of the operator.

Since the object of any electrode regulator is to maintain a constant current input to the furnace, it is evident that the time interval between the change in current and the functioning of the proper elements to overcome that change must be kept a minimum. This time interval has been materially decreased over the old type of regulator by the use of the new punched frame contactors, which are inherently quick acting. The dynamic braking circuit is also completed in a shorter interval of time after power is removed from the motor, thus decreasing to a minimum any over-travel of the electrode. Another obvious advantage is the elimination of bearings or parts subject to wear.

The same contact-making ammeter has been used on the new design, since this device has proved very satisfactory for the service in operating characteristics and in simplicity of adjustment.

A new voltage relay has been used to prevent lowering the electrode into the furnace bath in case of power failure or unbalanced conditions in the furnace. This relay permits a very low calibrating value, allowing the arc voltage to decrease to about 25 volts before opening the control circuit to the lowering contactor. Unlike the old equipment in which the relays were connected across the phases, and where failure of voltage on any phase opened the main control line to all contactors, the under-voltage relays on the new line are each connected across the arc and open the control circuit only to the lowering contactor controlling that electrode. By this arrangement, should a piece of floating metal come between the electrode and the bath, the under-voltage relay may trip, but since the raising contactor may still be energized from the contact-making ammeter, the electrode is raised free from the metal until a constant current input is again obtained, and meanwhile the other electrodes may automatically raise or lower, as required.

The auxiliary control is decidedly different from the old equipment in providing individual control of each electrode independent of the others. This feature is obtained by the use of a push-button station for each electrode. This station is provided with a "raise" button, a "lower" button, and a transfer switch for transferring from hand to automatic control. While operating with the transfer switch in the automatic position, it is still possible to "force" the electrode by use of the "raise" and "lower" buttons, this being an especially attractive feature to furnace operators. When doing this, however, the circuit to the contact-making ammeter is so broken that it is never possible for the ammeter to be operating to raise an electrode while the operator at the same time is trying to lower it.

*Industrial engineering department, General Electric Co., Schenectady, N. Y.

The same slow-down features are provided as on the old equipment, having a three-to-one ratio between manual and automatic electrode speeds.

The use of individual line switches for each electrode motor has been discontinued and a quick-make-and-break fused switch has been substituted which acts as a main line switch for all electrode motors. Each motor circuit is provided with fuses mounted in fuse cut-outs on the rear of the panel and, since the main line switch is mounted on the rear and operated from the front, the complete equipment is dead front except for the top base on which the contactors are mounted.

German Iron and Steel Production

Report of Allied Commission on Ruhr Activities Supplemented by Figures of Iron and Steel Industrial Union for Earlier Years

BERLIN, GERMANY, Feb. 20.—A report of the Mission Interalliée on the iron and steel production of the Ruhr district, published by the *Berliner Tageblatt*, shows that the productive capacity of the blast furnaces has increased by 32 per cent since 1914, that of the converters by 16 per cent, of the open-hearth furnaces by 40 per cent and of the mines by 33 per cent. The following figures show the development:

Ruhr District	Blast Furnaces, Cu. Ft.	Converters, Tons	Open-Hearth Furnaces, Tons
Beginning of 1914			
Built, number	96	46	245
Total capacity	1,504,000	856	7,494
Beginning of 1924			
Built, number	83	61	284
Total capacity	1,520,000	942	9,772
Beginning of 1924			
Building, number	19	2	13
Total capacity	328,000	45	800
Total, 1924, number	102	63	297
Capacity	1,848,000	987	10,572

Besides an increase in the number of furnaces, the rolling mill plants also have been considerably enlarged and improved. The average capacity of the blast furnaces has been enlarged from 15,700 to 18,100 cu. ft. and during April, 1923, production already was 10 per cent higher than during 1922. The improvement in the plants is verified by the following figures of the blast furnaces in the entire German territory, as published by the *Verein Deutscher Eisenhüttenleute:*

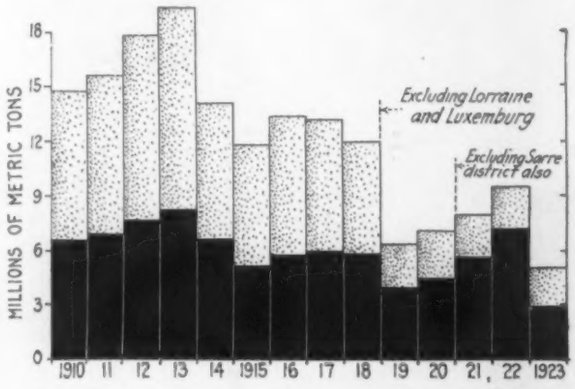
Number of Blast Furnaces	Total	In Blast	Total Productive Capacity In 24 Hours (Metric Tons)
January, 1920	234	120	36,007
January, 1921	237	130	36,157
January, 1922	239	141	37,449
January, 1923	218	145	39,531
December, 1923	218	66	40,860

Fluctuations in the production of raw material after the finish of the passive resistance in the Ruhr are given as follows by the Allied report:

(In Metric Tons)

	Pig Iron	Raw Steel	Rolled Material
December, 1923	47,481	75,443	71,382
January, 1924	239,779	289,340	229,158
February, 1924	355,292	459,000	352,832
March, 1924	465,125	610,508	511,991
April, 1924	518,002	677,875	553,878
May, 1924	348,424	438,608	419,338
June, 1924	394,781	514,487	413,605

The cost of production is stated to amount to 73.30 marks per ton of pig iron if Swedish ore is used, 76.70 marks with Wabana ore, 74 marks with minette from Briey, and 77.70 marks with Lorraine minette, at a coke price of 24 marks per ton. The calculation is made with the price of minette at the beginning of July, 1924, and at a franc rate of 84 to £1. The cost price for Thomas steel is given at 89.50 marks per ton with pig iron made with Briey minette, and 88.80 with pig iron made from Swedish ore, at a coal price of 18 marks and a coke price of 24 marks per ton. It is said in the report that at the current inland prices the German ironmasters were making large profits.



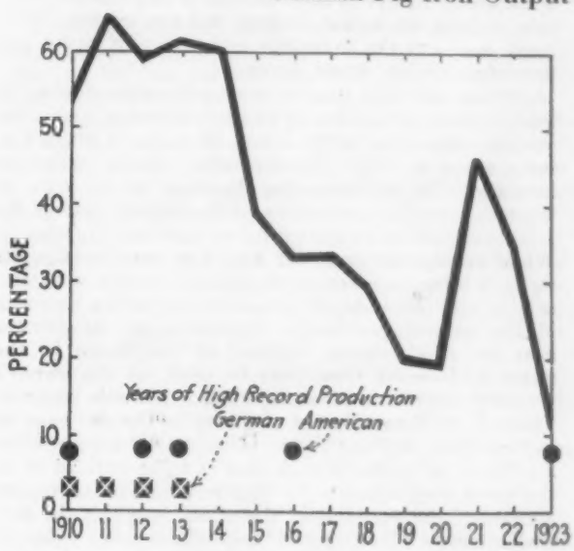
GERMAN Production of Pig Iron in 14 Years, Showing Four Successive Years of New High Records in 1910, 1911, 1912 and 1913, with Curtailed Output During the War and Much Less Since the Armistice. The black area is the production of the Rhine districts, including the Ruhr. Since 1918 the production of Lorraine and Luxemburg has not been included; since Jan. 1, 1921, the Sarre production, also, has been omitted. It will be noted that "unoccupied" Germany (dotted area) has produced a fairly steady tonnage since the Armistice

To confute the plea of the ironmasters that exports had decreased, the following figures are given which show that, with the export from the Ruhr district

German Pig Iron Production In Metric Tons
(As published by the Verein Eisen und Stahl-Industrieller, Düsseldorf)

	Hematite Pig Iron	Foundry Pig Iron	Bessemer Pig Iron	Thomas Pig Iron	Steel-Making Iron, Spiegeleisen, Ferro-manganese, Ferrosilicon	Puddled Iron	Other Pig Iron	Total German Production	Rhenisch-Westphalian District	Per Cent of Total
1910	2,965,810		471,366	9,338,961	1,372,196	644,992	.....	14,793,325	6,514,946	44.0
1911	3,063,583		374,455	9,851,113	1,733,280	511,792	.....	15,534,223	6,830,945	44.0
1912	3,338,839		388,855	11,397,965	2,201,489	525,423	.....	17,852,571	7,605,038	42.6
1913	3,657,326		368,840	12,193,336	2,599,887	489,783	.....	19,309,172	8,209,157	42.5
1914	2,494,832		237,988	9,289,989	1,996,255	370,257	.....	14,389,321	6,610,119	45.9
1915	2,283,538		187,522	7,246,322	1,793,865	278,684	.....	11,789,931	5,165,618	43.9
1916	2,019,991		152,660	8,515,086	2,380,308	216,693	.....	13,284,738	5,749,806	43.3
1917	699,707	1,312,570	130,019	8,307,571	2,446,092	195,351	50,937	13,142,247	5,932,914	45.1
1918	659,465	1,007,251	125,203	7,332,334	2,533,222	170,513	35,534	11,863,522	5,819,087	49.0
1919	570,924	857,838	57,983	3,151,115	1,497,859	102,599	45,555	6,283,873	3,892,484	61.9
1920	611,316	810,903	62,551	3,565,432	1,863,008	128,675	1,732	7,043,617	4,463,355	63.4
1921	638,057	919,924	31,226	4,003,998	2,121,666	127,107	3,368	7,845,346	5,637,169	71.9
1922	804,529	1,085,067	57,500	4,732,390	2,539,663	174,481	2,040	9,395,670	7,128,071	75.9
1923	451,213	643,364	20,164	2,310,841	1,392,749	113,146	4,863	4,936,340	2,925,107	59.3

German Pig Iron Output Compared with American



IN the four years, 1910 to 1913 inclusive, German production of pig iron made four new high records, each one a considerable advance over anything which had preceded it. In three of these four years American production of pig iron similarly made new high records. Since that time Germany has not produced a record, while the United States has made two new ones in 1916 and 1923 and, in addition, has made much higher tonnages than the 1913 figure in 1917, 1918 and 1920, all of which fell short of the 1916 record. Our diagram shows the relation between German output and American output in the 14 years, 1910 to 1923 inclusive. It will be noted that, beginning with 1911, there were four years in which Germany produced on the average more than 60 per cent of the American figure. The drop from that high level has been great. Only in 1921, when United States output went down to 42 per cent of the previous high figure and German tonnage advanced, did Germany produce more than 39 per cent of the American total. In that year Germany jumped from the 19 per cent of 1920 to more than 46 per cent. In 1923, the last full year for which German production has been reported, Germany made only 13 per cent as much pig iron as the high record total from the American furnaces.

which did not appear in the official German statistics, the official export figures for iron and steel products is almost doubled:

German Iron and Steel Exports

In Metric Tons	From the Ruhr, According to the Report of the Allied Committee	From the Unoccupied Part of Germany	Total
December, 1923...	59,563	134,411	193,974
January, 1924....	104,871	118,405	223,276
February, 1924...	110,584	147,029	257,613
March, 1924.....	141,806	134,223	276,029
April, 1924.....	134,438	123,268	257,706
May, 1924.....	131,821	118,303	250,124
Total	683,083	775,639	1,458,722

Besides the 683,083 tons which the Ruhr exported, 1,401,124 tons was sent from the Ruhr to unoccupied Germany, which is not recorded as imports in the official statistics, and the report estimates the German home consumption at 8½ to 9 million tons. The four principal customers of the exports of the Ruhr district during the six months from December, 1923, to May, 1924, are Holland, Belgium, Great Britain and Sweden.

Exports in six months are at the rate of about 3,000,000 tons per year, or about one-third of the 9,000,000-ton production of steel.

Exposition of Inventions in New York

The American Institute will hold an Exposition of Inventions in the Engineering Societies Building, New York, from April 27 to May 2. The exposition is designed to provide, for individual inventors and companies owning or having inventions developed, an introduction of their achievements to the public. Thus it is expected to serve the dual purpose of aiding the inventor and informing the public.

A program of lectures and demonstrations will be held coincidently with the exposition. Dr. Charles E. Lucke, department of mechanical engineering, Columbia University; Dr. J. H. James, Carnegie Institute of Technology; Dr. H. H. Sheldon, New York University, and Francis C. Elgar, vice-president American Institute, constitute the advisory board for the exposition. The institute has headquarters at 47 West Thirty-fourth Street, New York.

Production in the Mahoning Valley Slightly Reduced

Youngstown, March 10.—Operating schedules of iron and steel producing plants in the Mahoning Valley show mixed conditions in finished lines. In strips, merchant bars and tin plate, production is being carried forward at a rate close to normal. The Carnegie Steel Co., Sharon Steel Hoop Co., and the A. M. Byers Co. are operating plants in this territory close to capacity. The Youngstown Sheet & Tube Co. has banked Tod blast furnace, the smallest of three in its Brier Hill group, reducing the number of its active stacks in the Youngstown area to seven of nine, and cutting the district total to 32 of 45. The active furnaces represent 80 per cent of the district's iron-making capacity.

This week, 37 of 52 independent open-hearth furnaces are melting, against 39 last week. Because of the suspension of Tod stack, the Sheet & Tube company has taken off a number of open hearths in the Brier Hill complement, accounting for the net reduction. Independents are operating Bessemer departments at 65 per cent. The Steel Corporation subsidiaries, however, are maintaining steel-making close to a normal rate, bringing the general average of production of steel ingots in the Valley to 80 per cent.

Sheet steel production likewise shows a loss, with 91 mills scheduled, against a high several weeks ago of 115 of 127 in the Mahoning Valley. Most of the active units, though, are scheduled for a full week's production. The Sheet & Tube company and the Trumbull Steel Co. have contributed to the loss. Because of a defective motor, the Trumbull company has been obliged to suspend eight mills at Warren, including two jobbing mills and six sheet units.

The Republic Iron & Steel Co. is operating all of its steel bar mills in this area. Tube mill production includes 12 mills of 18, or 70 per cent.

Philadelphia Steel Club Holds Dinner

The Steel Club of Philadelphia held its sixth annual dinner at the Benjamin Franklin Hotel, Philadelphia, March 6. The attendance of more than 200 members and their guests included steel company representatives and many prominent buyers of steel in the eastern Pennsylvania district. Several of the guests came from such other districts as Pittsburgh, Baltimore and Buffalo. The dinner was followed by a brief entertainment and motion pictures arranged by H. B. Gaylord, chairman of the entertainment committee. Officers of the Steel Club are: H. B. Gaylord, Carpenter Steel Co., president; J. B. De Wolf, district manager Trumbull Steel Co., vice-president; William O. Lange, assistant sales manager Phoenix Iron Co., secretary-treasurer.

MUST REFUND MILLIONS

Ore Interests Will Receive Large Amount as Result of Decision by Supreme Court

WASHINGTON, March 10.—The decision on Monday of last week by the Supreme Court of the United States, holding that lessees of iron ore properties are entitled to deduct a reasonable allowance for depletion from their gross income, was delivered by Mr. Justice Sutherland. The decision was unanimous and affirmed the findings of the lower court, as stated in THE IRON AGE of March 5, page 713. It was a test case and as a result of the outcome the Government will be required to refund $30,000,000 in taxes to lessees of iron ore properties. The proceedings were known as the Alworth-Stephens Co. case. The issue rested upon the interpretation of Section 12 of the revenue act of 1916, concerning a reasonable allowance for depletion.

In passing upon the case, the Supreme Court decision stated in part:

"We agree with the circuit court of appeals, 294 Fed. 194, that, 'The plain, clear and reasonable meaning of the statute seems to be that the reasonable allowance for depletion in case of a mine is to be made to every one whose property right and interest therein has been depleted by the extraction and disposition of the product thereof which has been mined and sold during the year for which the return and computation are made. And the plain, obvious and rational meaning of a statute is always to be preferred to any curious, narrow, hidden sense that nothing but the exigency of a hard case and the ingenuity and study of acute and powerful intellect would discover.'

"It is said that the depletion allowance applies to the physical exhaustion of the ore deposits, and since the title thereto is in the lessor, he alone is entitled to make the deduction. But the fallacy in the syllogism is plain. The deduction for depletion in the case of mines is a special application of the general rule of the statute allowing a deduction for exhaustion of property. While respondent does not own the ore deposits, its right to mine and remove the ore and reduce it to possession and ownership is property within the meaning of the general provision. Obviously, as the process goes on, this property interest of the lessee in the mines is lessened from year to year, as the owner's property interest in the same mines is likewise lessened. There is an exhaustion of property in the one case as in the other; and the extent of it, with consequent deduction to be made, in each case is to be arrived at in the same way, namely, by determining the aggregate amount of the depletion of the mines in which the several interests inhere, based upon the market value of the product, and allocating that amount in proportion to the interest of each severally considered."

Annual Convention of Southern Metal Trades Association at San Antonio

The annual convention of the Southern Metal Trades Association will be held at San Antonio, Texas, April 28 and 29. At the session on April 28, addresses will be delivered by the following: "Relation of Technical Schools to Industry," by Prof. E. J. Fermier, head department of mechanical engineering, Agricultural and Mechanical College, State of Texas; "Importance of Analysis and Mixtures," by Chas. C. Kawin, Chas. C. Kawin Co., Chicago; "San Antonio an Industrial Center," by U. S. Pawkett, secretary South American Freight Bureau; "What Railroads Are Up Against," by Z. G. Hopkins, manager, Public Relations, Missouri, Kansas & Texas R. R.; "Co-Ordination of Members of SMTA," by J. Newton Barnes, treasurer, J. S. Schofield's Sons Co., Macon, Ga.; "Increased Consumption of Southern Pig Irons," by Russell Hunt, sales manager Sloss-Sheffield Steel & Iron Co., Birmingham.

At the session Wednesday, April 29, the following papers will be read:

"The Open Shop," Sidney Cornelius, manager, Open Shop Association, San Antonio.

"Doing Business at a Profit," George B. Cocker, general manager Cocker Machine & Foundry Co., Gastonia, N. C.

"Knowledge of Costs," J. L. Block, Madison & Block, CPA, Houston, Texas.

"Employees Safety in Business," C. A. Tatem, Texas Employers' Insurance Association.

"Why Molding Machines," C. W. Miller, service engineer Herman Pneumatic Machine Co., Pittsburgh.

"How Properly to Determine Quality of Foundry Sands," William Oberhelman, vice-president Hill & Griffith Co., Birmingham, Ala.

"Factor of Personality of Employees in Industry," W. S. Mosher, president Mosher Steel & Machinery Co., Dallas, Texas.

Youngstown Fabricators Are Busy

YOUNGSTOWN, March 10.—Fabricating interests in this territory generally are enjoying good business, with an upturn in demand as spring approaches. Gustave Kahn, vice-president in charge of sales of the Truscon Steel Co., states that February business was the best for this month in the company's history. It is expected operations, now running at 70 per cent, will feel the beneficial effects of new buying the latter part of this month, when shipments will be ordered forward. Capacity operation of the plant appears but a few weeks distant.

The General Fireproofing Co. is operating its metal furniture department at a capacity rate, and is receiving increased orders for fireproofing materials.

The Kalman Steel Co., idle until a few weeks ago, is now active at 50 per cent, with indications of further expansion in the near future.

This impending increase in business of fabricators will mean larger steel requirements. Last year, for instance, the Truscon company, operating below capacity much of the time, shipped 220,000 tons of fabricated products.

Spring Meeting of American Construction Council

The spring meeting of the American Construction Council will be held at the Hotel Biltmore, New York, on May 8 and 9. Following the meeting of the board of governors at which discussion will be on conditions in the construction industry, a conference on better building will be held, with manufacturers, dealers, financiers and management participating. The second day is devoted to a Conference on the Elimination of Peaks and Depressions, the purpose of which is to assist in bringing about coordination within the industry and its related groups necessary to secure the desired correctives. All elements will take part in the session, including transportation, those who have to do with the initiation of construction projects of engineering and architectural types, as well as manufacturers and distributors of materials, transportation agencies, and public officials.

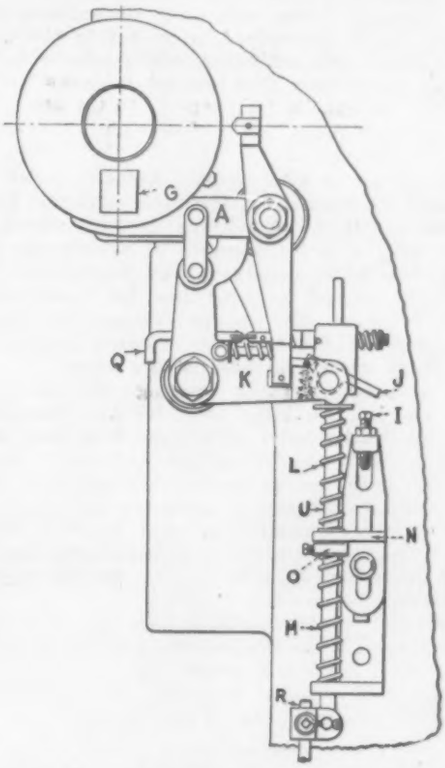
Inland Steel Co.'s Improvement Program Progressing

CHICAGO, March 9.—The Inland Steel Co.'s $8,000,000 improvement program for its Indiana Harbor, Ind., works has largely passed the contracting stage. Several weeks ago, the fabricating contract for a blast furnace was awarded, requiring 2600 tons of steel. A week ago, contracts for a cast house, skip bridge and an extension to its 14-in. mill, requiring an aggregate of 950 tons, were distributed. During the current week, contracts for a high line, 1500 tons, and a power house 700 tons, have been placed.

A substantial addition to the company's coking plant remains unplaced. The motorization of all the steam driven mills of the so-called No. 1 plant at Indiana Harbor is also contemplated, although no definite action has yet been taken to that end.

Non-Repeat Tripping Mechanism for Power Presses

Positive protection and convenience in changing from non-repeat to continuous operation are features of the special non-repeat tripping mechanism illustrated, which has been developed by the Loshbough-Jordan Tool & Machine Co., Elkhart, Ind., for use on its power presses. With this arrangement the pedal can be held down as long as desired and the press will not repeat because it is necessary to allow the pedal to return to the extreme upright position before the press can again be tripped. The change from non-repeat to continuous operation is made simply by turning one lever, one-half turn to



Attachment for Use on Loshbough-Jordan Presses. The pedal can be held down without the press repeating

left or right, while the press is in motion or at rest.

The arrangement of tripping mechanism may be noted from the illustration. In setting the machine to operate as non-repeat the lever *Q* is pointed downward as shown. The set screw *I* is then adjusted to cause the lever *J* to release rod *U* when lever *K* has been drawn downward, by pressure on the pedal, to a point where latch *A* will clear the clutch pin *G* just enough to allow the clutch pin to engage the flywheel. The set screw *I* may be locked permanently by tightening the lock nut provided. Following this, the bracket shown at *N* is adjusted to produce sufficient tension on spring *L* to return lever *K* to its extreme upright position as shown. The collar *O* is also adjusted to produce sufficient tension on spring *M* to return the pedal rods *R* and *U* to their extreme upright positions. The tension of springs *L* and *M* should be sufficient only to operate positively the levers and rod to which they are connected; if the adjustment produces more tension than is required it will cause the operator to become fatigued. To operate the machine continuously, lever *Q* is given one-half turn to the left so as to point upward.

The Chicago Foundrymen's Club has appointed J. H. Hopp, Hopp-Patterson Co., Chicago, to prepare a paper for presentation at the annual convention of the American Foundrymen's Association. The subject will be Cast Iron Foundry Operation.

Chain and Sprocket Committee Work to Be Broadened

The joint committee on the standardization of transmission chains and sprockets, which is made up of representatives of the Society of Automotive Engineers, American Society of Mechanical Engineers, and the American Gear Manufacturers' Association, has recommended that its personnel be increased and its work be broadened into a regular sectional committee under the procedure of the American Engineering Standards Committee, functioning under the joint sponsorship of the three organizations. Under the regular sectional committee organization the societies plan the formulation of American standards for transmission roller chains and sprocket teeth based on the standards already adopted by the automotive and mechanical engineers and the gear manufacturers association, and the study of the possibilities of standardizing the so-called silent type of transmission chains and sprockets.

New Remote Control Motor Starter

An automatic starter for use with alternating current, two or three phases squirrel cage induction motors, which may be operated from one or more locations and is provided with low voltage and overload protection, has been brought out by the Crocker-Wheeler Co., Ampere, N. J. The new starter is at present available in the following capacities: 7½-30 hp., 60 cycles, 220 volts; 7½-60 hp., 60 cycles, 440 and 550 volts; and 7½-30 hp., 25 cycles, 220, 440 or 550 volts.

The starter applies a voltage materially below normal to the motor terminals during the period in which it is coming up to speed, and after a set time the full voltage is applied automatically. The starting period is limited to a definite elapsed time rather than some set reduction of current input to the motor. The maximum time allowed by the starter is within the safe starting time allowable for the motors. This arrangement is said to permit of simplifying the design and to permit of an adjustable feature that causes the motor to be started safely and connected to the line regardless of the amount of current that it may happen to require to start its load. All operating contacts are made and broken under oil. The overload relays have oil-immersed contacts, and are adjustable for both time and load setting. A single lifting magnet is used, this being energized only during the starting and disconnected when the starter is in running position. This lifting magnet performs both starting and running functions. The oil tanks cannot be lowered until the door of the case has been opened, tripping the switch mechanism and leaving the contact board dead. Accessibility of all parts is also a feature.

The Carnegie Steel Co. will rebuild the ore bins at Carrie furnaces, Nos. 1, 2, 5, 6 and 7 of the Homestead Steel Works. The work will include dismantling the present bin bottoms and installing new bottoms of the Baker suspension type. The contract for dismantling, designing, material and erection work has been placed with the Arthur G. McKee & Co., Cleveland. This firm will also supply a 40-ton ore transfer car for filling the reconstructed bins.

The board of governors of the Southern division of the American Mining Congress decided at a meeting held in Birmingham to cooperate with the national organization in a survey of and publication of a volume on Southern resources and developments. The survey has been made by Dr. Mayce Payne, of New York, and the American Mining Congress will attend to the publication.

The French exports of pig iron dropped from 91,000 metric tons in December to 63,000 tons in January, says a cable to the Department of Commerce from Commercial Attaché Chester Lloyd Jones, Paris.

FOUNDRY CONVENTION

Syracuse, N. Y., Selected and Exhibition Will Be Held Oct. 5 to 9

The 1925 convention and exhibition of the American Foundrymen's Association will be held at Syracuse, N. Y., Oct. 5 to 9 inclusive. All activities, including registration, business and technical meetings, as well as the exhibits, will take place at the New York State Fair Grounds.

Several cities have been under consideration by the convention committee of the board of directors, among these being Atlantic City, Philadelphia, Baltimore, Springfield, Mass., and Washington. The committee, which consists of President O. W. Olson, Vice-President A. B. Root, G. H. Clamer, S. G. Johnston and V. E. Minich, finally accepted the invitation of the convention bureau of the Syracuse Chamber of Commerce, supported by the Governor of New York and Mayor of Syracuse, the Central New York Foundrymen's Association, the Syracuse Foundrymen's Association, and the Manufacturers' Association of Syracuse. The New York State Fair Commission has tendered the foundrymen the use of buildings on the state fair grounds, which offer more than 100,000 net sq. ft. of exhibit space, where exhibits of the character required may be installed and operated. The grounds are located within 12 min. automobile ride of the hotel district, with trolley and bus line service. Syracuse is pointed to as being within one night ride from all New England, Philadelphia, Baltimore, Pittsburgh, Cleveland and Detroit districts and all points in the provinces of Ontario and Quebec.

By agreement with the convention committee, none of the Syracuse hotels will make reservations until some date to be determined later, but in the meantime members and exhibitors will receive hotel information, together with a special form to be used in making reservation.

KEEN COMPETITION DEVELOPS

Prices of Wire Products and Plates Shaded in the Seattle Market

SEATTLE, MARCH 5.—February was only a fairly satisfactory month in the local steel trade, the amount of new tonnage booked by the representatives of the Eastern steel mills and also by the local steel interests being smaller than in January. Jobbers and consumers do not seem to be impressed by the advances made by the Eastern mills, and so far as the local district is concerned, these advances have not been effective. In fact, a large steel warehouse interest has made no changes in its prices since September of last year, at that time making slight advances on a few unimportant items. There is no anxiety being shown by buyers to anticipate, the policy being to buy only as early needs require.

Local prices in effect since last fall are strong, but here and there when an order is offered in the market, usually a slight concession in prices can be obtained from what is supposed to be the regular market. Recently, a fairly large order for plates was placed at 2.45c. Seattle, which is at least $1 under what most sellers are asking. Jobbers and warehouses are having a fair trade, but it is mostly current run of small orders to meet nearby needs.

The local market on wire products is weak in prices, and one leading interest that has for some time been trying to sustain prices, has finally decided to meet competition, and is selling nails and wire in small lots at practically the same prices as are being quoted for car load lots. In some cases, wire nails have sold in car loads at $3.50 base, per keg, delivered Seattle. The water and rail freight from Eastern mills to Seattle is about 72c. per keg, so that $3.50 figures back to $2.78 at Pittsburgh mills. The demand for wire nails is fairly active, especially for building nails, and also for cement coated nails for fish containers.

Demand for structural steel is more active, and considerable new work is coming up. The Star Iron Works at Tacoma has taken about 600 tons of shapes for the Cushman power project, and county bridges taking about 500 to 600 tons, also a car ferry requiring about 550 tons, are expected to be ready for bids in a short time. Plain material is holding firm at 2.50c. to 2.55c., delivered Seattle, most of the business being placed at the lower figure.

Plates are not as firm as they were a month ago, a recent order going at 2.45c., but two leading Eastern mills, have been out of this market for some months, refusing to meet prices. Plates at 2.50c., Seattle, figure back to 1.78c. at Pittsburgh mill. The local Pacific Coast Steel Co. is now equipped to roll universal plates up to 22 in. and is taking a good share of the local trade. This concern can also roll beams up to 8 in. and angles up to 10 in.

The demand for merchant steel bars is fair, but for reinforcing bars is more active. Recently the Pacific Coast Steel Co. advanced its prices on steel bars $1 per ton, now quoting 2.55c., delivered to local warehouse. The company is a large maker of reinforcing bars, quoting about 2.75c., delivered. Few foreign bars have come in this market for some time, but recently some Belgian bars were imported into Portland by a leading heavy hardware house at the reported price of 2c. delivered, all charges prepaid by the seller.

The demand for black sheets is limited in the Seattle market, few being used, but the demand for galvanized is active, and prices seem to be firm on the basis of 2.70c. Pittsburgh for blue annealed, 3.50c. for black and 4.75c. for galvanized, the rail and water freight from Pittsburgh mill being 72c. per 100-lb., and $1 per ton from Chicago mill. The American Car & Foundry Co. has recently been a fairly large buyer of roofing sheets for cars it is building for the Northern Pacific and other roads.

Indications are that building materials of all kinds will be in more active demand this year in the Seattle district than last year, which broke all previous building records. So far this year, new building permits issued are in excess of last year.

Charles R. Long, Jr., president Charles R. Long, Jr., Co., manufacturer of railway and industrial paints, Louisville, Ky., vice-president Harry Vissering & Co., manufacturer of railway supplies and equipment, Chicago, vice-president the Okadee Co., manufacturer of locomotive specialties, Chicago, and vice-president Viloco Machine Co., manufacturing machinists and engineer, Benton Harbor, Mich., has purchased the entire interest of Harry Vissering, Chicago, in the companies mentioned, Mr. Vissering having retired from all of these organizations. Mr. Long remains president of the Charles R. Long, Jr., Co., and has been elected president of the Viloco Machine Co. He continues as vice-president of the Okadee Co. and of Harry Vissering & Co. A. G. Hollingshead has been made president of the Okadee Co., and G. S. Turner, president of Harry Vissering & Co. F. G. Zimmerman has been made vice-president and secretary of the Okadee Co. and Harry Vissering & Co., secretary-treasurer of the Viloco Machine Co. and assistant secretary Charles R. Long, Jr. Co.

In the courts of Seattle, Wash., the Government has been awarded a verdict for $333,601 damages against the Puget Sound Machinery Depot of Seattle. The suit was over a war time contract for the building of Scotch marine boilers by the defendant for the Government, after it had delivered the materials for the boilers to the defendant, the claim being that the Seattle company refused to return the materials or pay for them. The controversy was caused by the fact that the Government cancelled the contract for the boilers before they were completed, due to the sudden ending of the war.

FEBRUARY STEEL OUTPUT

Increase Over January Less Than One Per Cent—Rate at 48,460,000 Tons Per Year

A very small increase in the steel ingot production was recorded in February—only 1003 tons per day in excess of the January rate. At 155,833 tons per day the February production made a gain of but 0.65 per cent over the January rate of 154,830 tons (revised). This is in decided contrast to the pig iron increase in February of about 5.5 per cent over the preceding month.

The statistics of the American Iron and Steel Institute show that the February output of the companies which made 94.84 per cent of the country's total in 1923 was 3,547,020 tons. Assuming that the 5.16 per cent not reporting produced at the same rate, a total February output is indicated of 3,740,004 tons. The corresponding annual rate is about 48,460,000 tons or about 89½ per cent of capacity, against 89 per cent in January.

The table gives the production by months of the different kinds of steel, together with the estimated daily rate for all companies.

Monthly Production of Steel Ingots, Reported by Companies Which Made 94.84 Per Cent of the Steel Ingot Production in 1923

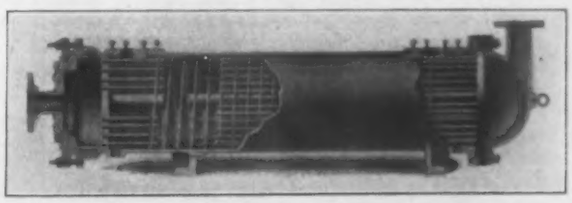
(Gross Tons)

Months 1925	Open-Hearth	Bessemer	All Other	Calculated Monthly Production All Companies	Approximate Daily Production All Companies
Jan.	3,262,748	689,996	11,960*	4,180,413*	154,830*
Feb.	2,931,964	602,042	13,014	3,740,004	155,833
1924					
Jan.	2,766,534	667,032	12,577	3,633,639	134,579
Feb.	2,902,641	695,905	14,085	3,809,185	152,367
March	3,249,783	706,801	15,260	4,187,942	161,075
April	2,575,788	573,381	12,356	3,333,535	128,213
May	2,060,896	425,099	6,648	2,628,261	97,343
June	1,637,660	310,070	2,622	2,056,466	82,259
July	1,525,912	241,880	5,162	1,869,416	71,901
Aug.	2,042,820	361,781	5,759	2,541,501	97,750
Sept.	2,252,976	409,922	6,844	2,814,996	108,269
Oct.	2,505,403	438,468	7,030	3,111,452	115,239
Nov.	2,479,147	459,349	8,397	3,107,226	124,289
Dec.	2,810,404	546,506	11,641	3,551,825	136,609
Total	28,809,964	5,836,194	108,381	36,645,444	117,453

*Revised.

For Cooling Engine Jacket Water

A device for cooling jacket water from oil and gas engines and compressors is here illustrated. The jacket water is circulated in a closed system through the shell space of the cooler with low pressure loss,



The Jacket Water Is Circulated In a Closed System and Is Cooled by Raw Water Flowing Through the Tubes

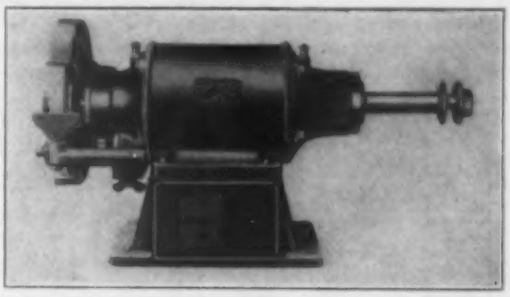
and is cooled by raw water flowing through the tubes in a single pass. Scale trouble in the engine jackets is eliminated by having distilled water circulated through them in a closed system. Cylinder scoring and other troubles due to overheating are said to be eliminated and it is claimed that the consumption of cylinder oil is markedly reduced.

The cooler is of multiwhirl design and compactness is a feature. A removable tube bundle, made up of a continuous helical baffle of sheet metal formed around a central core tube, with tubes inserted through holes in these baffles, is contained in a bored cast-iron shell. One tube sheet is stationary and the other is part of a floating head designed to accommodate expansion movement of the tubes. The tubes are expanded into the tube plates and the tube bundle is arranged for convenient removal for inspection and cleaning. The outside packed head is a feature emphasized as eliminating leakage of water into oil through faulty packing. The apparatus is being marketed by the Griscom-Russell Co., 90 West Street, New York.

Combination Grinder and Buffer

The combination grinding and buffing machine illustrated, which is available in ½ and 1 hp. sizes, has been added to the line of the Hisey-Wolf Machine Co., Cincinnati. The machine may be equipped for either bench or floor mounting, the former being designed with an open type of spindle extension, the floor machine having an incased spindle extension. It is adapted to a variety of work, including that done by wire brush or rotary wire rasp wheels.

Ball bearings are employed throughout, the incased-spindle machine being fitted with four bear-



The Machine Is Available In Either Bench or Floor Types. In addition to buffing and grinding it may be used for work requiring wire brush or wire rasp wheels

ings and the open-spindle model with two. The bearings are completely inclosed and have felt protector washers on each side of their housings. The spindles are heavy and are accurately ground, and the flange washers are machined all over. The inner flanges are keyed to the spindle, but may be conveniently removed by hand. The adjustable wheel guards are of standard dimensions and are designed so that the wheels can be removed independently.

The motor starter is a feature emphasized as providing the maximum protection to the motor from overload when starting and while running. The machines are regularly made for alternating current and direct current.

Production of Malleable Castings

January production of malleable castings, reported by the Department of Commerce at 66,367 tons, makes the biggest month's production since last March with 72,807 tons. The present month is considerably above December's 58,773 tons and a little higher than the 64,379 tons of January, 1924. Shipments likewise at 59,138 tons were greater than for any month since March. Orders booked during January amounted to 61,140 tons, the largest since last February, while production was 57.6 per cent of the capacity of the 144 plants reporting.

In a comparative summary for 131 identical plants over the past year, January production is given as 62,829 tons, which is considerably higher than the average month of 1924. Total production for the calendar year 1924 was 590,454 tons. As shipments during the same 12 months amounted to 575,417 tons, the January figure of 55,672 tons was well above the average month of 1924.

French coal production has been increasing constantly since the Armistice. December, 1924, showed 154,013 tons per working day, compared with 144,680 tons in January, 1924; 121,064 tons in January, 1923, and 136,147 tons in the average month of 1913. French production of coke advanced from 228,329 tons in November to 240,026 tons in December.

Hardness Numbers and Their Relation*

Stress-Strain Curve in Practice and Its Interpretation in the Light of Hardness—A Common Language Suggested

BY DR. H. P. HOLLNAGEL

IN the previous article the ideal physical state of metals was reviewed. It is now pointed out that this has not been obtainable in practice because of the varied manner in which they are prepared, all variables being far from under perfect control. The properties of metals depend largely upon the physical conditions of manufacture and the rate at which these change. In a great measure this is because greater refinement of method and process are necessary to obtain the desired ends than can financially be made compatible with production and market requirements. Hence, the

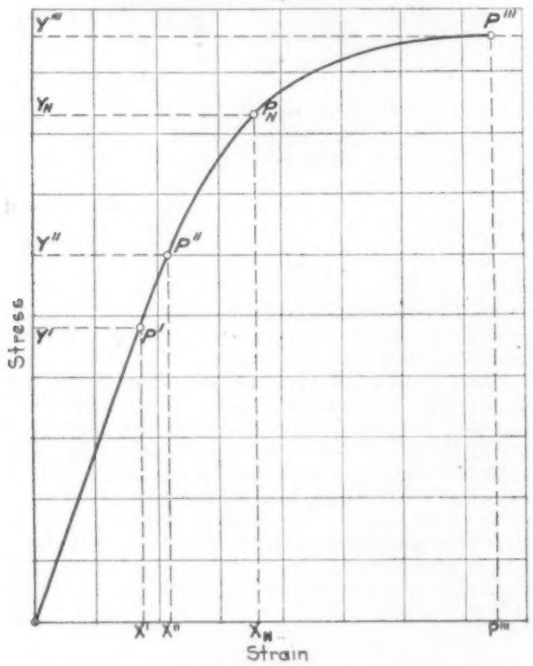


Fig. 3—Stress-Strain Curve. The exaggerated curve represents but average values for engineering materials

products that result are masses of metal that in their structure are conglomerates of crystals without regard to their distribution or orientation. No one physical quantity may therefore be said to characterize or have a preponderant part in the hardness of such masses.

If the definition: "Hardness is the cohesive resistance to deformation," is to be accepted, only an average value of hardness, atomically speaking, can be referred to, for a true hardness as defined in terms of the atom can have but little significance in metals as they are used in practice. Metals have been prepared for which a true hardness could have significance, about which more may be learned elsewhere.[1]

Constitution of Metals

Attention has been directed to the fact that the penetration of one atom into another is characterized in X-ray crystal analysis by what is called the space lattice constant—*d*, a very important physical magnitude. It would perhaps be better to refer to the average atomic radius as of paramount importance for, as has been indicated, we can hardly speak of the radius of a single atom in any material, more particularly when it is subjected to phenomena where permanent deformation occurs. In all probability such deformation exists in randomly laid down crystals. Under stressed conditions it is likely that there is no constancy of this magnitude in the sense of a value to which all atoms may be compressed and beyond which they do not interpenetrate. From experience gained on the containing effect of metals under stress and recent evidence on copper crystals[1] under cold work it appears that several times as much stress is required to restore metals to their original state after once being deformed from the virgin condition, whether they be composed of a single crystal or a large number of smaller ones, randomly disposed. The average value of the radii of all atoms which participate in a strain

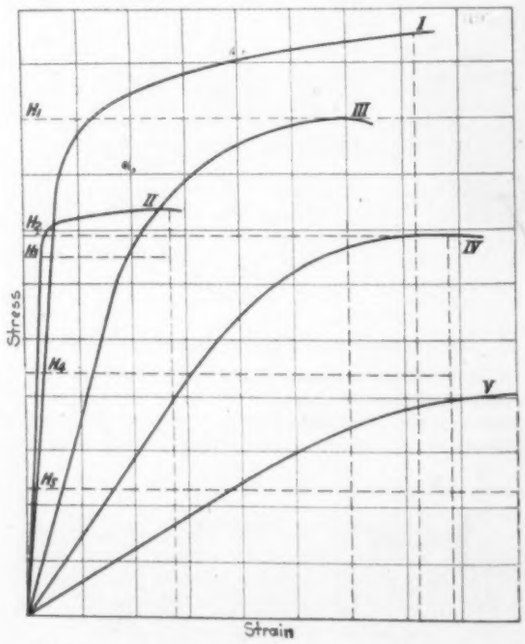


Fig. 4—Average Hardness and Stress-Strain Curves

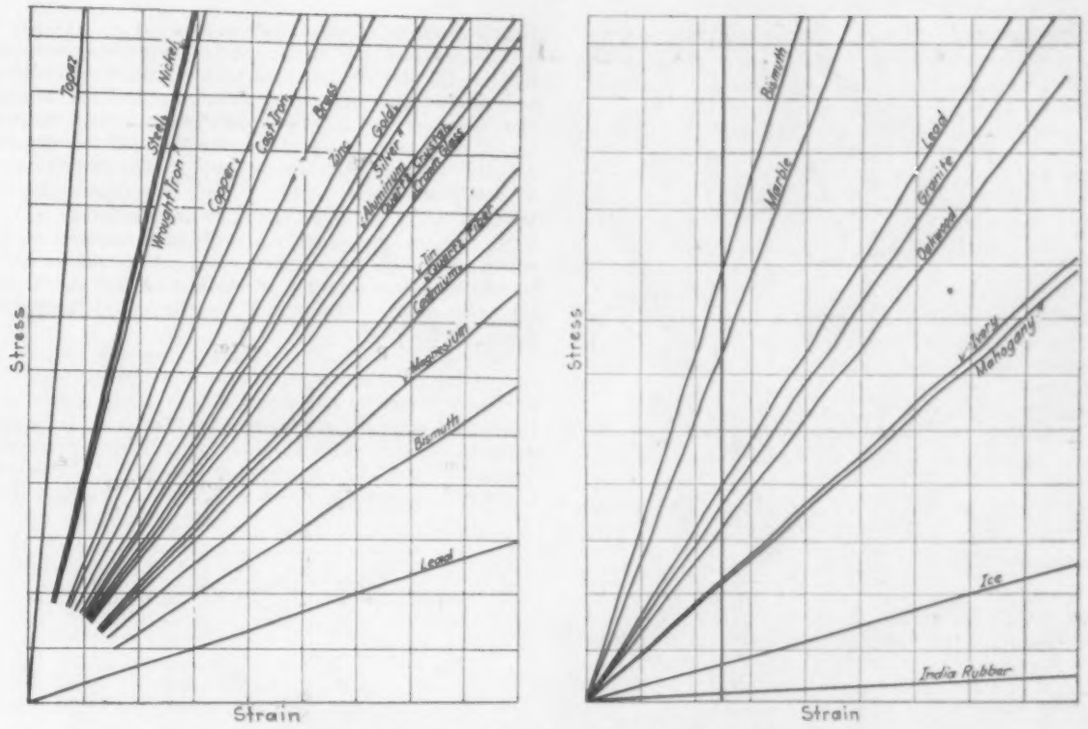
under compression, for example, should therefore be taken over the entire volume immediately affected. It will be more representative of such effects and will be indicative of the local hardnesses as generally determined. Not only is this characteristic of such measurements but in the hardening process of solid solutions it is true. Stranger atoms in such solutions are disposed in matrices of metal largely according to chance and there is no regularity in the interference of one lattice with the other.

Some metals, bismuth, antimony, etc., considered from the electron point of view have different radii of combination and as such have different combining tendencies on two sides of the atom.[2] They act as metal and non-metal, depending upon whether the bonds on one side are completely satisfied and more closely knit than are the bonds on the other. The one grouping resembles that of the diamond, the other that similar to a metal with its electro-statically held electrons.

*The first half of this article was published in THE IRON AGE, Nov. 27, 1924, p. 1404. Illness has delayed the completion of this concluding portion. The author is with the Department of Physics, General Electric Co., Lynn, Mass.

[1] W. P. Davey, Schenectady Research Laboratory, has recently prepared copper in sufficiently large crystals to establish very interesting physical properties.

[2] "Structure of Organic Crystals," by W. Bragg—*Nature*—July 22, 1924, p. 115.



Figs. 5 and 5A—Moduli of Elasticity of Various Materials

Such cases should have different thermal expansions in different directions and may explain the action of graphite, which expands 3 per cent along its axis, for a rise of 900 deg. C., and extends to a very limited degree, as does the diamond, in a direction perpendicular thereto. It may simultaneously explain the difference in the relative hardness of these forms of carbon. It is conceivable at least that the varied grouping, here referred to, will cause differences in hardness in two directions at right angles to one another and that average hardness therefore has significance even within crystalline aggregates themselves, since the radii of combination seem to vary markedly.

Metals in solidifying from a molten mass probably grow by the formation of a skeleton or framework into which numberless minute crystals become oriented. This growth takes place in accordance with the electrical character of the molten material in the immediate vicinity of the nearest crystal. If any electrically free bonds happen to be unsaturated on either unbound atom (molten metal) or bound atom (crystal) the probability is that these will tack on to others and the process continue until the majority of bonds have been satisfied. Growth will therefore take place in the direction where electrical freedom is the greatest, i. e., where the electric field is maximum; this may be in any direction whatsoever, for the temperature distribution, which is generally quite non-uniform within the molten mass, plays a very important part in such phenomena. In such directions as neutral systems result, it is quite possible the strength will be the greater and it is quite probable that, in such combinations as occur in steels, an action like this may be the cause of the lattice being considerably opened and the specific volume as a result materially increased. The open structure of a manganese steel may be explained in this manner and its consequent hardness and resistance to wear be viewed accordingly.

Stress-Strain Curve in Practice

Before proceeding with a discussion of hardness testing devices, it will be well to examine a stress-strain curve in some detail.

There are at present no marketable materials made in accordance with a regular disposition of the atoms. We are therefore not in position to predict how this curve would appear for metals made under such conditions. It is conceivable that materials of high ductility or rigidity would show quite different values of these properties when produced in the most regular fashion attainable. For this reason the exaggerated curve of Fig. 3 represents but average values for engineering materials as we know them. The ordinates are the stresses in pounds per square inch, while the abscissae are the corresponding average strains as measured in deformations per unit length. These are arrived at by application of different non-uniformly distributed loads to a test specimen of fixed dimensions. The ratio of the difference between two ordinates at any point P_n to the corresponding difference in abscissae gives an approximate value of the average modulus of elasticity. This magnitude may have relatively high values at a comparatively low stress such as is representative of a point P'. When the material has been deformed to such a degree as to cause yielding on the average to take place, the point P' will have been passed; beyond it the ratio is no longer a constant for increased stresses, and the so-called proportionality or elastic limit (average) has been exceeded. The point P'', where the material definitely and permanently begins to change its dimensions, is termed the yield point. Elongation or flow takes place there because of the insufficiency of the average forces of restitution of all the atoms that are affected. Under continually increasing stress these forces are overcome and finally, when insufficient to maintain coherence of the material, rupture results. The point at which this occurs, represented as P''', is the ultimate limit of the material (average).

In general, if there is a great increase of strain between P' and P''', the elastic after effect is great. This tends to restore the material to its original state, due to the activity of the aforesaid forces. If there is considerable permanent set between P' and P'''' then the material is very ductile (or plastic); but if P', P''' and P'''' are very close together, then there is little or no elastic after effect, the substance does not yield appreciably and is said to be brittle.

The forces of restitution may be large or small in such cases but the displacements of the atoms will be small in either case, consequently the area $P'\ P''''\ X''''\ x'$ will always be comparatively small for brittle materials. The area of such a small surface is representative of work done per unit volume and it may readily be understood that as such the entire area under the stress-strain curve is likewise characteristic of the work done in stressing the material to the ultimate limit. This quantity varies with the physical properties of the material.

From what has been said in the previous paragraph

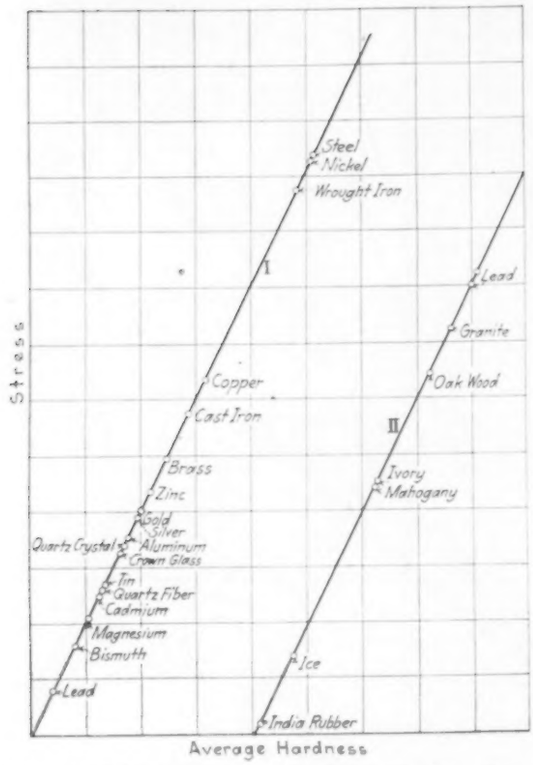


Fig. 6—Relation Between the Surface Hardness Numbers of Metals and the Stress

it appears that solid substances have a particular property characterized by the work done on them per unit volume per unit strain for the applied stress. This property has different values, depending entirely upon what portion of the stress-strain curve is examined. At P', for example, its value is $\frac{(OY')(OX')}{2(OX')} = \frac{OY'}{2}$. At P_n this property will have the value given by the $\frac{\text{Area } OP_n x_n}{OX_n}$. In this manner a value is obtained which is entirely characteristic of the stress history of the material.

This will be called the average hardness of the material. It is a definite physical quantity having the physical dimensions of pressure $ML^{-1} T^{-2}$ being the work necessary per unit strain to overcome the average of the forces of resistance of all the atoms per unit volume participating. This in the last analysis characterizes the different hardnesses herein referred to. It is termed the average hardness[2] of the material not only because it is an average of the atomic forces of restitution with which we are concerned but also because the work of deformation is cumulative in producing any resultant strain. This when divided by that strain must give an average value. It is equivalent to constructing a rectangle of such a height as to give the same area as that under the curve and having the strain as its base.

As will be seen, this provides a possible means for comparing various types of hardness numbers. They are determined by devices which do work while elastically or permanently deforming material in a non-uniform manner, and as there is a stress-strain diagram characteristic of every solid of given dimensions, a ready comparison of their numbers resolves itself into a determination of the volume of stressed material and the magnitude of the strain. Of these the former is the more difficult.

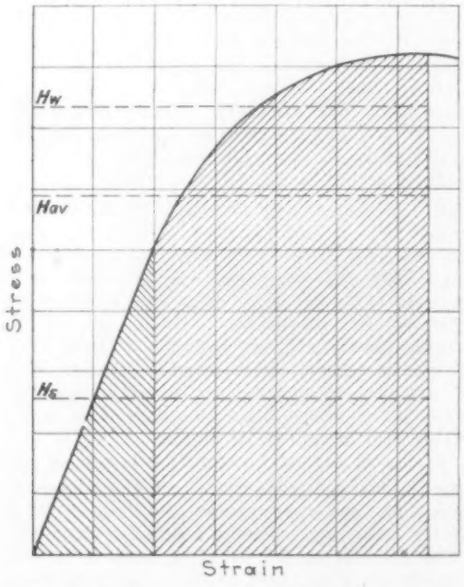


Fig. 7—Surface and Work Hardness. For stress the numbers are proportional to hardness

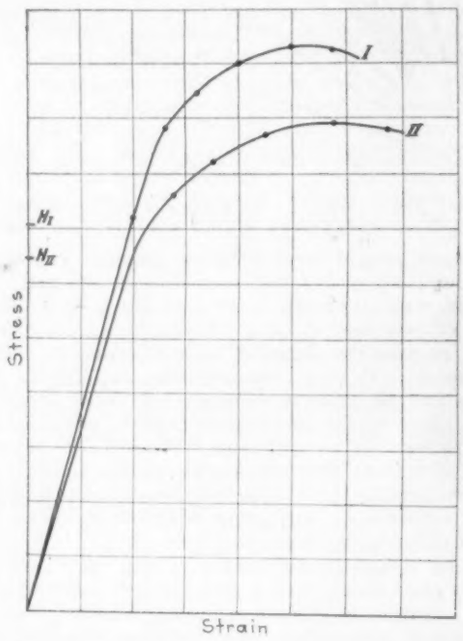


Fig. 8—Curve I Represents Stress-Strain Under Impact Stress. Curve II represents stress-strain as ordinarily obtained

The area under a stress-strain curve varies in character with the magnitudes of the (*a*) modulus of elasticity, (*b*) proportionality limit, (*c*) yield point and (*d*) ultimate limit of the material. It is understandable that when all of these are high a large value H_i, of the average hardness is to be expected (See curve I, Fig. 4). If the value of (*a*) is high and the values of (*b*), (*c*) and (*d*) are such as to flatten the curve at relatively low values of the stress, a value H_{ii} will be lower (see curve II) than when there is considerable ductility accompanied by a lower value of the modulus of elasticity and a high value of the proportionality limit—H_{iii} (see curve III).

On the other hand, if the modulus of elasticity is low as in certain metals and the ductility relatively high with comparatively low value of (*b*), then a value like H_{iv} or H_v will be obtained which is entirely different from either of the three. As referred to, this depends upon the ultimate limit and the value of the strain (see curves IV and V), from which it is evident that values of average hardness may be obtained to fit almost any of the many cases which may arise.

Let the properties of solids be examined somewhat further. All metals have approximate proportionality limits. This makes possible the determination of a quantity which is characterized by the modulus of elas-

[2] The term "average hardness" has been utilized by Mayer. See the splendid review of this work by Dr. S. W. Hoyt, A. S. S. T., Oct., 1924.

ticity and the proportionality limit of the material. This property would be determined by the work represented by the area of a triangle for each substance as divided by its base. For purposes of discussion we may call this the average surface hardness of the material. It is presumably characterized by the depth of material associated with the surface, which manifests its resistance to deformation by the return of the material to its original surface within the proportionality limit when the stress is removed.

The ratio of the mutually perpendicular sides of such triangles determines the respective moduli of elasticity of the various materials concerned. One-half of the stress ordinate at any proportionality limit P'' will be directly proportional to the surface hardness of that material at that limit. Figs. 5 and 5A show a series of graphs of the moduli of several materials. On this basis the surface hardness of metals at any stress within the proportionality limit is directly proportional to one-half the applied stress. Therefore, for any given value of the strain (A) the surface hardness numbers of metals[4] should follow a relatively simple law. (See Fig. 6.)

The hardness as measured by any device in which the ultimate limit is arrived at for a portion of the material will be made up of two parts, one the average surface hardness here referred to; the other, the hardness due to cold work. As shown in Fig. 7, the resulting average hardness as determined by indentation will therefore be made up of two factors, generally speaking, one characterized by the modulus of elasticity and the proportionality limit, the other by the yield point and ultimate limit as determined by the cold work and the other physical properties. Therefore, it seems likely that substances have hardnesses ascribed to them in terms of the same physical properties as are of importance in the determination of their strength. The areas which characterize the work expended in reaching these values of the stress are represented by the shaded portions of the figure and the hardnesses are designated as H_s, H_w and H_{av}.

Various Methods of Testing

The question now arises, does this reasoning lend itself to a satisfactory discussion of the various methods of testing for hardness? Can hardness numbers as determined by different devices be transferred from one to the other with any considerable degree of precision? Before effecting such a transfer one must know what actually has been measured. Let the indentation, rebound and scratch methods be examined, and to eliminate one source of difficulty let it be decided that the size of specimen be considered such as to make impossible the effect of the anvil or contact of specimens with the anvil in such apparatus where their consideration is necessary. In scratch devices this is of less importance than in the other two.

It is understood also that, in any device that does not permanently deform the specimen, the yield point and proportionality limit have not been exceeded and therefore the H_{av} will very approximately be determined by $1/2 \frac{OP'X'}{OX'}$. For all devices in which permanent set is caused the reasoning of the previous paragraph holds; and the reading is a measure of the average ordinate as determined by $OP'''\ X'''/OX'''$ which is an average hardness.

In general, therefore, the readings for the same material as determined by two devices, one operating within, the other beyond, the elastic limit will differ when reduced to a common scale, the latter being the higher. In rebound apparatus, however, this additional fact must be considered; because of the short time of application of the stress, the material may act as though it has a higher elastic limit and a high modulus of elasticity and the resultant hardness number recorded may be higher than that which would be determined by the same stress applied at a lower time rate, as is the case in indentation apparatus (See Fig. 8).

The scratch test is accomplished by causing an indentation by means of a tool which during motion compresses the material ahead of it until the ultimate limit is exceeded. As a result the material ruptures and falls away, as the process proceeds throughout the entire extent of the scratch. The reasoning herein discussed therefore applies equally as well to it. Why do the numbers obtained by the three types not agree? The proposed definition of hardness is "The cohesive resistance to deformation" and dimensionally considered this is the work of stress per unit volume per unit strain expended.

The amount of work done and the volumes upon which it is performed are very different in each case. The rate at which the work is performed is so radically different in each of the three cases that it would be quite out of the ordinary to expect that precise relations could be had. In rebound apparatus where the energy is expended in either elastic or permanent deformation in a very short time (thousandths of seconds), the impulse forces are often excessive, being greater at times than the elastic stresses necessary for permanent set; but still the materials show no permanent deformation, because of the time required for such phenomena to establish themselves.

A scratch, as the record left by a deforming process which permanently destroyed the surface of the material, may have been accomplished in a fraction of a second or several seconds; in either case the record is different, other things being equal. All indentation devices require time, usually a few seconds at least, permanently to set the material. So from the viewpoint of time involved in the application of the stress, we have a considerable degree of variability with which to contend. Stating the problem in another way, the stresses are distributed in entirely different manners in specimens when tested by the three different devices and therefore the strains are in accordance therewith.

In the scratch test, assuming the abrading tool applied normally to the material, the maximum strain is probably perpendicular to the surface of the tool. In indentation and rebound tests the maximum strain most likely lies in the axial direction of the application of the stress, i.e., normal to the surface of the material. It would appear that the non-uniformly distributed strains developed lie within a volume of the character of the fourth part of a sphere ahead of the abrading tool in the scratch and a hemisphere in the case of the indenting implement of the other two. In either case the volumes affected are quite different and, as the stresses are of entirely different magnitudes, the volume stress intensity varies greatly in different directions in the several cases.

Conclusion

From what has been set forth[4] it is believed that to ascertain satisfactory relations between hardness numbers from a physical standpoint, they must be reduced to a common language, i.e., work per unit volume per unit strain. The problem is not how to make a new device or obtain new nomenclature but how physically to ascertain the quantities necessary to establish correlations precisely. This does not in any way prevent us from continuing present use of hardness measuring devices more particularly as they are often used for specific purposes, i.e., in the measuring of specification numbers.

The combined experience of several safety engineers is represented in "Teaching Safety to New Employees," an illustrated non-technical pamphlet published by the National Safety Council, 168 North Michigan Avenue, Chicago. Statistics are pointed to as showing that the new employee is more liable to injury than one of long service, and the importance of special care in reaching the new man is stressed.

By official announcement the Bartlett-Hayward Co., which, as announced last week, was acquired by the McClintic-Marshall Co., will be maintained as a separate unit, the former company's name being retained.

[4] The author hopes in the near future to present elsewhere a mathematical discussion of this aspect of hardness.

European Iron and Steel Markets Easier

German Selling Boom Less Vigorous—French Selling "Ententes" Active—Situation in England Most Unsatisfactory

(By Cablegram)

LONDON, ENGLAND, March 9.

PIG iron is weak, on poor domestic and export demand. New shipbuilding orders continue very scarce. Stocks of Cleveland grades are not heavy but makers are anxious to dispose of their surplus and hence are quoting lower prices. Hematite is in abundant supply but there is very little substantial demand. Prices are easier.

Foreign ore is dull and consumers here are barely interested. Bilbao Rubio is held nominally at 22s. to 23s. ($5.24 to $5.48) c.i.f. Tees.

Finished steel is dull but steady. There is considerable activity in engineering and constructional plants, but few new orders for ships. Export buying is poor. Clyde shipbuilding output for February was 12 vessels launched, with an aggregate of 40,936 tons gross register.

Sheets and Tin Plate

Tin plate demand is improving, with some fair business. Many makers, not accepting the minimum price, are asking up to 22s. 7½d. ($5.39) basis IC, f.o.b. Home and export demand are broadening, though so far no large lines are involved.

Galvanized sheets are dull.

Black sheets are quiet. The minimum price for Japan specifications reintroduced quotations, is now, for 6 x 3 ft., 13's, £16 10s. (3.51c. per lb.) for 107 lb. and £16 5s. (3.45c.) for 112 lb., both f.o.b.

On the Continent of Europe

Continental position is somewhat obscure, very little business passing through traders here, but the works generally are reported well placed. German merchants have sold Belgian merchant bars to Japan at £5 9s. (1.16c. per lb.).

In Germany the Rothe-Erde Werke has resumed operations at its open-hearth steel plant at Aix-la-Chapelle [seven 35-ton basic furnaces are listed at that plant].

In France the Société Metallurgique de Senelle-Maubeuge again is operating its thin and medium sheet mills at Laval Dieu. The Hauts-Fourneaux de Saulnes has blown in a second furnace at Hussigny.

Franco-German trade negotiations have taken a favorable turn. The question of the Lorraine steel export quota is likely soon to be adjusted. French makers have fixed minimum prices for foundry pig iron, semi-finished material and certain finished products.

No Improvement in British Iron and Steel Conditions

LONDON, ENGLAND, Feb. 19.—Another month has nearly passed and still there is little sign of revival in business in the iron and steel trades. The conditions as a whole are distinctly bad and the outlook is far from promising. The whole question is one of cost, this being chiefly responsible for the inability of makers to compete with the Continent. Prices are being continually reduced, it is true, but the export demand for British pig iron is exceedingly poor and at the moment the only business coming the way of the furnaces is for the home trade. Production is to be curtailed; already one furnace has been blown out on the North East Coast, while in Scotland one firm alone has decided to damp down seven furnaces.

It is hoped that this drastic cutting down of production will lead to better selling conditions, but at the moment stocks accumulating at makers' yards are quite substantial. Home foundries are buying only from hand to mouth and steel works are not buying much, as they, too, are finding difficulty in moving their own products. The present price of Cleveland foundry is about 78s. 6d. f.o.b. The Continental price

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British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.76 per £1, as follows:

Durham coke, del'd	£1	4s.				$5.71	
Bilbao Rubio ore†	1	2½				5.36	
Cleveland No. 1 fdy	4	3				19.75	
Cleveland No. 3 fdy	3	18				18.56	
Cleveland No. 4 fdy	3	17				18.32	
Cleveland No. 4 forge	3	16				18.09	
Cleveland basic	4	0				19.04	
East Coast mixed	4	5				20.23	
East Coast hematite	4	19	to £5	0s.		23.56	to $23.80
Ferromanganese	15	0	to 15	10		71.40	to 73.78
*Ferromanganese	15	0	to 15	10		71.40	to 73.78
Rails, 60 lb. and up	8	10	to 9	0		40.46	to 42.84
Billets	7	2½	to 8	0		33.92	to 38.08
Sheet and tin plate bars, Welsh	7	17½				87.48	
Tin plates, base box	1	2¼	to 1	2¾		5.27	to 5.41
						C. per Lb.	
Ship plates	9	0	to 9	10		1.91	to 2.02
Boiler plates	13	0	to 13	10		2.76	to 2.87
Tees	8	17½	to 9	7½		1.89	to 1.99
Channels	8	2½	to 8	12½		1.73	to 1.83
Beams	7	17½	to 8	7½		1.67	to 1.78
Round bars, ¾ to 3 in.	9	2½	to 9	12½		1.94	to 2.04
Galv. sheets, 24 gage	16	5	to 16	15		3.45	to 3.56
Black sheets, 24 gage	12	0	to 12	5		2.55	to 2.60
Black sheets, Japanese specifications	15	5				3.24	
Steel hoops	10	15	and 12	10*		2.28	and 2.66*
Cold rolled steel strip, 20 gage	16	0				3.40	

*Export price.
†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron: (a)						
Belgium	£3	15s.			$17.85	
France	3	15			17.85	
Luxemburg	3	15			17.85	
Basic pig iron: (a)						
Belgium	3	14			17.61	
France	3	14			17.61	
Luxemburg	3	14			17.61	
Billets: (a)						
Belgium	5	5	to £5	10s.	25.00	to $26.18
France	5	5	to 5	10	25.00	to 26.18
Merchant bars:					C. per Lb.	
Belgium	5	15	to 6	0	1.22	to 1.28
Luxemburg	5	15	to 6	0	1.22	to 1.28
France	5	15	to 6	0	1.22	to 1.28
Joists (beams):						
Belgium	5	10			1.17	
Luxemburg	5	10			1.17	
France	5	10			1.17	
Angles:						
Belgium	5	18½	to 6	0	1.26	to 1.28
⅛-in. plates:						
Belgium	7	2½			1.51	
Germany	7	2½			1.51	
¼-in. ship plates:						
Luxemburg	7	2½			1.51	
Belgium	7	2½			1.51	

(a) Nominal.

is about 74s. f.o.b. Antwerp, which leaves a considerable margin in favor of the foreign product.

Possibility of Government Protection

In semi-finished materials it is the same story; the Continent is the cheapest seller by far, but, even at the low prices quoted, consumers in this country will go no further than purchasing to cover bare requirements, having apparently little faith in the maintenance of prices on the other side. There is a considerable amount of talk that semi-finished steel is to be introduced into the Government's proposals for the safeguarding of industries, but it is not known yet what the proposals are, and it may be that it is this uncertainty which is causing the hesitation on the part of buyers.

In finished iron and steel materials the slackness at the shipyards is reflected in the poor demand for shipbuilding steel and this, of course, means little work for plate rollers. The export demand is practically negligible, save in certain specialties, while home consumers are not keenly interested.

For some time past there has been friction between the manufacturers and merchants engaged in the tin plate trade. Various meetings have been held to see if some agreement could not be reached, and this has at last been settled on amicable terms, and all merchants are to receive a commission of 1½ per cent. The basis price of tin plate recently has been reduced 6d. This was followed by a considerable amount of inquiry, although at the moment the actual volume of orders placed has not been large.

Trade in galvanized sheet is very dull, as also is the case in black sheets, but makers of the latter have just reduced their prices by 30s. to £16 10s., and it is anticipated that some good business should be coming along from Japan at somewhere around about this figure.

ORGANIZATION IN IRON TRADE

German Producers in Various Lines Striving for Common Ground—Market Less Active, but Many Makers Have Orders for Months Ahead

BERLIN, GERMANY, Feb. 16.—The boom in the German iron industry has somewhat ebbed recently. Demand is less strong and traders expect a further slackness in business. Opinion on the development of the market in the near future is varying, but, as it is sometimes difficult to get material from the works, traders still are doing a good business. Manufacturers also are more hopeful and expect that, together with the decrease of traders' stocks, the spring business will give a new impetus to trade.

The formation of syndicates in the industry will also largely influence the further development of the market. As negotiations in this respect are developing favorably, the manufacturers are optimistic, especially as they have orders for several months. They reluctantly accept further orders and the time of delivery is at present about eight weeks for bar iron and thin sheets. Prices have altered little recently, and are on the average as follows:

	Marks per Metric Ton		Per Gross Ton
Blooms	116	or	$28.07
Billets	127	or	30.73
Sheet bars	132	or	31.94
Wire rods	150	or	36.30
			Per Lb.
Bar iron	140	or	1.51c.
Structural shapes	133	or	1.44c.
Universal iron	146	or	1.58c.
Hoop iron	174	or	1.88c.
Sheets, heavy	150	or	1.62c.
Sheets, medium	184	or	1.99c.
Plates, 1 to 3 mm. (No. 19½ to No. 11½ gage)	220	or	2.39c.
Plates below 1 mm.	235	or	2.54c.
Wire, drawn bright	185	or	2.00c.
Wire, drawn galvanized	230	or	2.49c.

Scrap prices have been weakening during the last fortnight and steel scrap is quoted at about 78 marks ($18.88), solid scrap at 76 marks ($18.39), chips for open-hearth, 62 marks ($15), and cast iron scrap at 82 marks ($19.84). The association of the producers of semi-finished material has issued guiding prices of 112.50 marks ($27.22) for ingots, 120 marks ($29.04) for billets and 125 marks ($30.25) for sheet bars, so that market prices are considerably higher than these quotations.

Thyssen and several other works have largely increased their semi-finished material production. Thyssen has enlarged his mills not only for semi-finished material but also for bar iron and structural shapes.

German Domestic Market

Domestic demand for pig iron is still brisk and the Pig Iron Association has raised prices for all grades by 2 marks per ton, to compensate, it is said, for the rise in ore and other production costs. Conditions in the German ore market have changed little. As the iron works are well employed there is fair demand but the works are buying only to the extent of their requirements for the next few months. It seems that a rise in ore prices is expected, as a large Berlin trading firm has made a contract with the Russian Soviets for 5,000,000 tons of South Russian ore at a price considered high compared with present market quotations.

Negotiations for the establishment of a strong organization of the iron traders have not been successful. It seems, however, that the iron works are interested in the formation and probably will undertake to supply only the members of the traders' organization.

To Sell Machine Tools in England

Six large Central German machine tool makers, Wotan, Braun, Schuethoff, Hiltmann & Lorenz, Müller & Montag, and Union, have established in London the United Machine Tool Co., Ltd., for the sale of their products in Great Britain, the British dominions and colonies.

The Association of German Manufacturers of Railroad Cars, poorly employed for a long time, is negotiating with the French railroads for more than 3,000 cars. These orders are to be executed on the German reparation account, and altogether 50 firms are participating. An order for 700 cars, which is to be distributed among eight Rhenish-Westphalian firms, already has been given by the French Northern Railroad.

Syndicates Still Forming

The idea of forming organizations of the manufacturers and traders in the different industries is making considerable headway. After the establishment of the syndicate of tube producers a new cartel of the producers of rails is to be formed. Negotiations are conducted to reestablish the former German Iron Traders' Association, especially for bar iron, hoop iron, structural shapes and thin sheets. It is contemplated also to organize the trade in pig iron and come to an understanding in regard to the imported amounts of Luxemburg pig iron and semi-finished material. There is every prospect of a favorable conclusion of these negotiations. Traders hope to be able to specialize stocks, which would largely reduce the number of different grades to be kept in stock. The stimulus for organizing the traders has especially been given by the formation of the Raw Steel Syndicate and by the desire to be able to counteract the predominating influence of this organization in the iron trade.

The Raw Steel Syndicate restriction of production during March, at 85 per cent of the quotas is not applied to semi-finished material, to thin sheets, to castings and forgings. The Raw Steel Syndicate has now consolidated its position and it has already been proposed to abolish the stipulation which enables any member to give notice of withdrawal at the end of the present year. It is expected that the next meeting of the syndicate will decide in favor of the proposal.

Meanwhile the formation of syndicates for vari-

ous products is making headway. The Gute Hoffnungshütte has now joined the syndicate of the producers of semi-finished material, which enables the latter to start sales operations. Negotiations for the establishment of a heavy steel syndicate are also progressing favorably. Both in the heavy steel and in the rolled wire syndicate the firms which have sales organizations will continue to sell their own products, while the syndicate takes care of the production of the other members.

FRENCH INTRIGUED BY ENTENTES

Iron and Steel Producers Combining to Fix Prices in Home Markets—Not Operative for Export

PARIS, FRANCE, Feb. 20.—Announcement that the ententes among producers for fixing average prices were virtually concluded gave rise to a marked increase in demand from consumers. This demand is, however, keeping within reasonable limits, as the average prices that have been fixed so far do not differ sufficiently from the normal quotations, at the beginning of this month, to justify any rush on the part of consumers desirous of buying prior to the application of the new minimum prices. The situation has therefore undoubtedly improved.

Unfortunately, there are obstacles in the way of a revival of the market, in so far as this revival might be facilitated by the new ententes just concluded: (1) The Franco-German negotiations for the conclusion of a commercial treaty were unsatisfactory; (2) the recent British note has caused some uneasiness here, owing to the repercussion which the payment of our debt to Great Britain might have on our finances, in the not unlikely event of Germany not executing her engagements in the forthcoming years; (3) the cost of living has gone up to a very high level, and a request for an increase of wages is sure to come shortly.

On the other hand, the present depreciation of the franc will certainly improve our situation on the export market, but the fact that the Belgian franc has fallen more than ours is an adverse factor.

Pig Iron.—The demand for phosphoric pig iron is satisfactory. The price of 335 fr. ($17.87 per gross ton) for phosphoric chill-cast foundry pig iron No. 3 P. L. (Longwy parity), fixed by the producers' entente as from Feb. 3, seems to have been maintained so far; but the producers of phosphoric pig iron did not all join the "entente," and there still are a few dissenters, who are quoting about 330 fr. ($17.60). On the other hand, it is not impossible that the present average price of 335 fr. be shortly raised to 340 fr. ($18.13). There is now good inquiry for export, so much so as to have made some operators in the United States show some uneasiness.

Producers in Continental Europe are at present offering pig iron at $22.50 delivered in the United States, i.e., at $1.50 below the lowest American quotations. As such a price is in keeping with those normally done in Europe, the acquisition of dumping leveled at European sellers by American operators cannot be justified.

Chill-cast foundry pig iron No. 3 P. L. is quoted f.o.b. Antwerp, 345 to 350 fr. (Belgian) ($17.70 to $17.95). For basic pig iron, the price in Belgium, per ton, delivered, is likewise 345 to 350 fr. (Belgian). As regards hematite pig iron, although the volume of business done is not important, the disappearance of British competition, owing to the improvement of sterling, has made this market stronger; 430 fr. ($22.93) per ton, ex-producing works, seems generally to be the lowest price.

Ferroalloys.—Lack of water for power in the producing districts is such as to have restricted to a minimum the production of ferroalloys. Prices therefore are firm and rising. Certain kinds of ferrosilicon are unobtainable. The high grades come from Switzerland.

Ferromanganese keeps at 1,550 to 1,560 fr. ($82.66 to $83.20), irrespective of its origin: French, British or Norwegian.

Spiegeleisen is firm at 330 to 335 fr. ($17.60 to $17.87) for 10 to 12 per cent, and 660 to 665 fr. ($35.20 to $35.47) for 18 to 20 per cent, per ton at producing works in the east of France.

Semi-Finished Steel.—This line is rather inactive as regards new business, but order books are fortunately still well filled. The conclusion of an "entente" among the producers of semi-finished steel was followed by the fixing of the basis price for blooms at 420 fr. ($22.40), basic quality, with an addition of 50 fr. ($2.67) when open-hearth steel is supplied. For export, prices have become slightly stronger. Present quotations, f.o.b. Antwerp, are:

Blooms	£5	2s.	6d.	($24.40)
Billets	5	5	0	(25.00)
Largets	5	8	0	(25.70)

French shipments of semi-finished steel to Germany during the last month have been practically nil but, on the other hand, Germany, with her hands full with supplying her own market, has almost ceased to export any tonnage of such material.

Rolled Products.—The bulk of the French mills, following upon the "entente" they just entered into, have come to an average price agreement for beams and merchant products: 500 fr. (1.19c. per lb.) was the price so fixed for the former and 530 fr. (1.26c.) for the latter (Thionville parity). The rise included in these prices, by comparison with previous quotations, covers the increases in transportation, coke and wages costs. With the security afforded them by the fixing of these basis prices, some producers, particularly well placed, already are doing business at higher prices, although orders have become scarcer than during the previous week. For rails no similar "entente" could be established and, consequently, no average price has been fixed.

Export markets for rolled products are without much animation, and prices are easier in sympathy with the weakness of the British market. Beams are quoted £5 10s. (1.17c. per lb.) and bars £5 16s. (1.23c.), f.o.b. Antwerp.

Sheets.—No change is to be reported in the situation of this department, where orders remain unimportant and quotations irregular. In Belgium, however, the market for sheets, both inland and for export, is stronger than ours.

Prices quoted in France are:

Large plates	630 to 650 fr. or 1.50c. to 1.55c.
Heavy sheets (over 5 mm. or No. 6½ gage)	660 to 680 fr. or 1.57c. to 1.62c.
Medium sheets (from 2 to 3 mm., No. 14 to No. 11½ gage)	860 to 890 fr. or 2.05c. to 2.12c.
Light sheets (under 2 mm.)	1,000 to 1,100 fr. or 2.39c. to 2.62c.

For export, heavy sheets are being quoted £7 2s. 6d. (1.51c.).

Wire Products.—After the rush of the last week this section has become calm again. Delays of delivery do not exceed six weeks and prices are slightly easier. Wire rods are quoted at 600 to 630 fr. ($32 to $33.60) inland and £7 to £7 2s. 6d. ($33.32 to $33.92) for export.

Effective, March 2, the South Tacoma, Wash., car shops of the Northern Pacific Railroad started to operate six days per week. For more than a year, these shops which employ about 1200 men, have been operating only five days per week.

Building permits were issued at St. Louis during February for improvements of the estimated cost of $4,871,425, against $2,339,885 in February, 1924, a gain of $2,531,540. Of the permits, $3,549,880 were for new buildings and $1,321,545 for alterations.

GERMANY LOSING TRADE

Conflicting Opinions as to Cause of Decline of Machine Tool Exports

World trade in machine tools is slipping from the hands of Germany, according to a report to the United States Department of Commerce from Trade Commissioner Pilger, Berlin. The application of prohibitive duties by Italy, France and Belgium has been responsible in part for the depression which has hit the German industry. During 1924, Mr. Pilger reports, it was estimated that the German machine-tool building industry was working at about 50 per cent of capacity, while it was also stated that plants making extra heavy machinery were operating at only about 15 to 20 per cent.

The industry expects to obtain some advantages in competitive ability with the reduction of duties on foreign raw materials, and is bringing strong pressure to bear on the government with this end in view. Manufacturers are urged to build their own iron and steel foundries, or to buy or consolidate with such plants in order to reduce costs.

Decreased volume of orders in the domestic market has resulted in price cutting. Whereas, manufacturers formerly practised strict adherence to the prices fixed by their trade associations, which was not difficult as long as demand kept pace with offer, most firms are at present attempting to dispose of stocks accumulated during the inflation period by dumping these on the market at reduced prices. Twist drills, for example, are sold below prewar quotations.

The German trade press is almost unanimous in its belief that the causes of the depression are the high cost of production and the impossibility of competing in the world markets because of these high costs; the industry is equally firm in the conviction that the cause is to be sought in government regulations of various sorts, while it is bombarding the unimaginative public mind with such assertions in an effort to obtain favorable taxation, lower export freight rates, and other privileged government treatment for the particular industry involved. In the main, according to Mr. Pilger, the difficulty lies not so much in these elements as in the fact that manufacturers have not yet returned to reasonable profits, but are still adding safety margins in every step of production from raw materials to finished products.

FRENCH IMPORTS AND EXPORTS

Pig Iron, Ferroalloys and Iron and Steel Products —Heavy 1924 Exports of Steel

PARIS, FRANCE, Feb. 20.—French imports and exports of iron and steel products in 1924, with comparisons for 1923, are shown below:

Pig Iron: Imports, 42,485 metric tons in 1924, against 63,661 tons in 1923. Exports, 766,793 tons in 1924, against 591,857 tons in 1923. The net excess of exports over imports thus increased from 528,196 tons in 1923 to 724,308 tons in 1924, a gain of 37 per cent.

Ferroalloys: Imports, 13,377 tons in 1924, against 6002 tons in 1923. Exports, 17,224 tons in 1924, against 21,710 tons in 1923. The excess of exports over imports thus decreased from 15,708 tons in 1923 to 3847 tons in 1924, a drop of 75½ per cent.

Iron and Steel Products: Imports, 681,383 tons in 1924, against 665,939 tons in 1923. Exports, 2,248,537 tons in 1924, against 1,847,902 tons in 1923. The excess of exports over imports thus increased from 1,181,963 tons in 1923 to 1,567,154 tons in 1924, a gain of 32½ per cent. Much of this gain must be attributed to the large exports of semi-finished material into Germany, in anticipation of the tariff change taking effect in January of this year.

LUXEMBURG 1924 IRON OUTPUT

Pig Iron 85 Per Cent of Pre-War—Steel Far Above Pre-War, the Gain Being in Basic Bessemer

LUXEMBURG, Feb. 16.—Since the cessation of the free import of iron products into Germany on January 10, Luxemburg manufacturers have been making strong endeavors to find compensating markets for the loss of their German business elsewhere. The large increase in production compared with 1923 has made it imperative to find other foreign markets for their products. Special attention has been paid to the American business and a large number of orders have been received for semi-finished material. The depreciation of the franc is of great assistance to the manufacturers in getting foreign orders and considerable quantities of material are going to South America, to Japan, to the Balkan States and to Turkey. Generally the works have orders for about two months and prices have been maintained. There is little German competition except in rails. The German market is at present supplied from the large stocks which have been established there.

Luxemburg iron and steel production has considerably increased. Pig iron amounted during 1924 to about 85 per cent of the pre-war production, while steel was much above pre-war.

Luxemburg Iron and Steel Production
(In Metric Tons)

1924	Basic Pig Iron	Foundry Pig Iron	White Pig Iron	Total Pig Iron Production	Basic Steel	Open-hearth Steel	Electric Steel	Total Steel Production
January	161,857	55	305	162,217	144,854	1,218	506	146,578
February	165,148	.....	165	165,313	147,599	2,862	491	150,952
March	182,918	3,380	495	186,793	152,778	2,775	488	156,041
April	179,511	5,662	450	185,623	153,373	2,990	505	156,868
May	177,397	5,790	1,120	184,307	149,014	2,360	832	151,206
June	167,782	7,032	225	175,039	142,158	889	526	143,573
July	173,540	7,088	.....	180,628	154,633	2,229	476	154,633
August	175,301	6,066	.....	181,367	154,165	1,753	366	156,284
September	172,253	4,715	75	177,043	155,994	1,841	403	158,243
October	186,027	3,010	25	189,072	166,107	1,133	718	168,158
November	179,877	5,624	15	185,516	156,212	1,029	557	157,798
December	193,239	7,354	.....	200,593	181,078	987	610	182,645
Total 1924	2,114,855	55,476	2,885	2,173,216	1,857,965	22,036	6,083	1,886,084
Total 1923	1,365,050	37,269	4,247	1,406,566	1,176,707	22,736	4,269	1,197,729
Total 1913	2,360,488	172,013	15,366	2,547,861	.....	.....	.....	1,182,227

COST TRENDS IN MANUFACTURING

BY DR. LEWIS H. HANEY
Director, New York University Bureau of Business Research

1. The labor cost of iron and steel continued to decline relatively to the value of the product. This ratio has now reached a low level. It is doubtful if so favorable a condition as now exists can continue much longer.

2. Coal is only a little higher in price than at the low point of last summer and promises nothing more than moderate firmness in the near future.

3. Coke prices have reacted from the run-up in December and January, and the market seems likely to continue weak for some time.

4. Zinc prices, while fairly firm at present levels, are likely to show reductions during the next few months, owing to increased productive activity and an accumulation of stocks which may be expected in another month or two.

5. There is nothing **on the cost side** *to indicate higher prices in the near future for iron and steel (or galvanized sheets).*

Labor Costs in Iron and Steel

THE January data recently made available show that the downward trend in the ratio of payrolls to the value of iron and steel produced has continued. This is, of course, favorable to good earnings on the part of the manufacturers of iron and steel.

Figured at current prices, the value of the total production of iron and steel in January moved up sharply, and, as shown in Fig. 1, reached a point considerably higher than in January, 1924.

The total payrolls of the iron and steel industry also increased considerably, but not so much as in December and the increase was at a slower pace than the rise in the value of products.

As a result, *the ratio of payrolls to product values declined to a level about the same as that at which it stood in the middle of* 1923. *This is a very favorable indication bearing on February earnings statements of iron and steel producers.*

Bituminous Coal Situation

BITUMINOUS coal markets have been weak owing to overproduction. The outstanding feature of the situation has been the continued heavy shipments from the non-union fields.

As shown in Fig. 2, production has expanded very rapidly on the basis of only small price advances. The January total production of bituminous coal was not far under the high levels of recent years.

It is worth noting, however, that since the week of Jan. 10 there has been a sharp decline in the output of bituminous coal. The output for the week of Feb. 22 reached a low level of about 9,500,000 tons. The present rate of output is less than has existed in any corresponding week of recent years with the exception of 1919 and 1921.

The price of bituminous coal now seems to be at bottom levels. Much depends upon weather conditions, but it is significant that: (1) Industrial stocks have declined and are now at a rather low level; (2) production has been sharply checked in recent weeks and has fallen off more than usual for the season. *It, therefore, seems not unlikely that the coal market will at least hold at present levels, with the possibility that it will firm up a little in the near future.* The efficiency of railroad transportation, which makes it possible to get along with small stocks, and the demonstrated tendency of the mines to expand output rapidly on price gains make it clear that no urgency is required in buying, but it seems wise to cover requirements for the next two or three months at present prices.

The recent trend of coal prices is further illustrated by the following statement:

Composite Average Price of Bituminous Coal (Coal Age)

Feb.	11, 1924	$2.27	
July	14, 1924	1.96	low
Aug.	18, 1924	2.00	
Sept.	15, 1924	2.02	
Oct.	13, 1924	2.10	
Nov.	17, 1924	2.06	
Dec.	15, 1924	2.04	
Jan.	12, 1925	2.12	
Feb.	16, 1925	2.04	

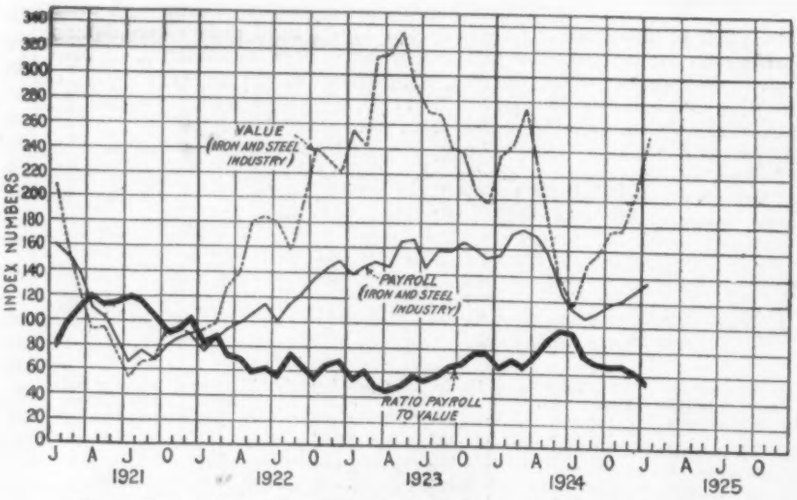
INDEX NUMBERS
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Fig. 1—Comparison of Payroll in the Iron and Steel Industry with the Value of Total Iron and Steel Output

The value of iron and steel is estimated by applying THE IRON AGE composite pig iron price to the monthly production of pig iron and the price of steel billets to the monthly production of steel ingots. Current prices are used, which place the figures on a basis of replacement cost. The payroll curve is based on Bureau of Labor Statistics data

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The college graduate in industry.—Learning organization routine occasions sharp let-down in mental effort as contrasted with keen intellectual demands of college work. This often results in loss of study habit, unfitting the college man for concentration on industrial problems to be met later.—Page 758.

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Ford fights car assignment ruling.—I. C. C. order forbidding assignment of privately owned freight cars during emergency periods is subject of annulment application by Ford Motor Co. and others.—Page 759.

Predicts business stability.—President Campbell of Youngstown Sheet & Tube Co. expects more stable conditions in next four years than have existed for some time past.—Page 762.

More than a half billion tons of iron in use in United States.—Estimate includes all manufactured products of iron in its various forms.—Page 784.

Germany losing its grip on world machine tool business.—Price-cutting competition seriously injuring business of German machine tool builders, reports American Government representative in Berlin.—Page 777.

Proposed railroad abandonment presents serious problem.—The Boston & Maine's proposal to abandon 180 miles of branch lines, on which there is an annual loss of about a half million dollars, is strongly objected to by the public affected.—Page 783.

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Coke Prices and Production

THE story of the coke market has been a rapid increase in production followed by lower prices, due to the failure of the demand for iron to increase, as hoped for. The lack of demand for coke has resulted in the accumulation of stocks.

At present the coke markets are weak, reflecting the current weakness of the iron market (which will be discussed next week).

No reason is apparent at present for buying coke ahead of nearby requirements.

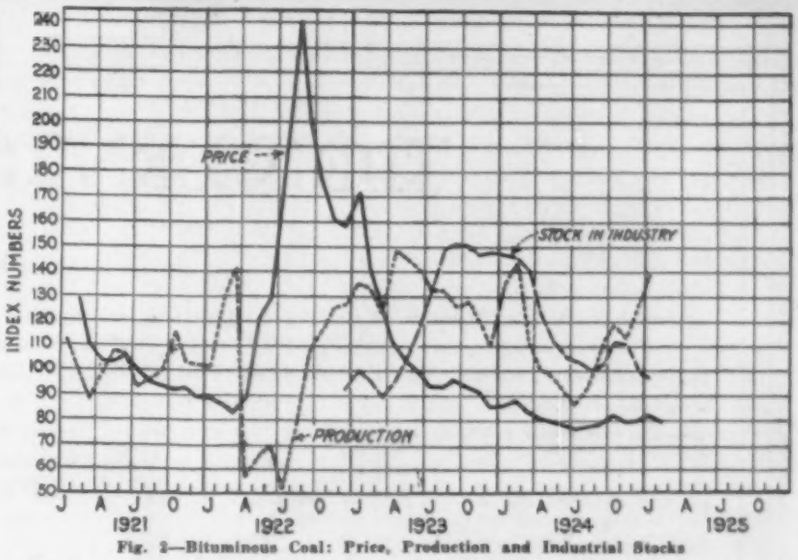

Fig. 2—Bituminous Coal: Price, Production and Industrial Stocks

The solid line shows the course of the *Coal Age* composite bituminous coal price index. The dotted curve is the monthly production of bituminous coal, estimated from the weekly figures of the Geological Survey and adjusted for seasonal variation. The dashed line represents the movement of industrial stocks of bituminous and anthracite coal, as reported by the National Association of Purchasing Agents

Zinc Outlook

ZINC recently has been among the strongest non-ferrous metals. The reason for this relative strength has been that the number of retorts in operation declined on the whole from April, 1923, down to September, 1924. Furthermore, the stocks of zinc have not at any time reached the high figures of the latter part of 1921 and early 1922. During the last six months zinc stocks have declined.

The statistical position of zinc is still somewhat stronger than that of some of the other non-ferrous metals, but indications point to a weakening of the situation.

(1) The number of retorts in January was nearly up to the peak level of recent years.

(2) The rate of decline in zinc stocks has fallen off.

(3) The price of zinc in January averaged about the same as at the 1923 peak.

While some further strength may continue in the zinc market, these indications suggest that long term commitments should not be made on the basis of present prices.

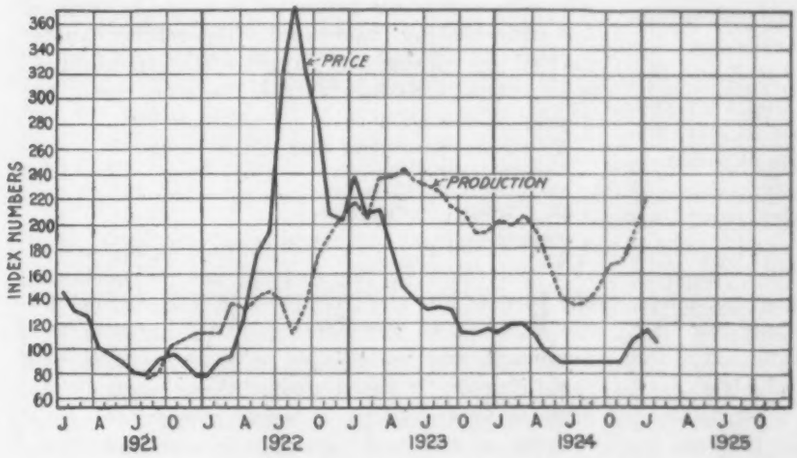

Fig. 3—Coke: Prices and Production

The solid line shows a monthly index of coke prices based on THE IRON AGE Connellsville quotations. The dotted line represents the Geological Survey's figures covering the production of beehive and by-product coke

THE accompanying article on the trend of costs in manufacturing is the third monthly analysis contributed by Dr. Haney, director of the New York University Bureau of Business Research. With the next installment of this weekly "Business Analysis and Forecast Section" will appear the third monthly discussion of the situation of the iron and steel markets in particular. In the last issue of the month, March 26, will be given the indications of that month in relation to the general business trend, as was done in the fourth issue of January for January and in the fourth issue of February for February.

A reading of the italicized introductory tabulation in each case gives a quick understanding of the high spots as well as affording a convenient way of making a review of the economic developments of a given phase of business over a period of time.

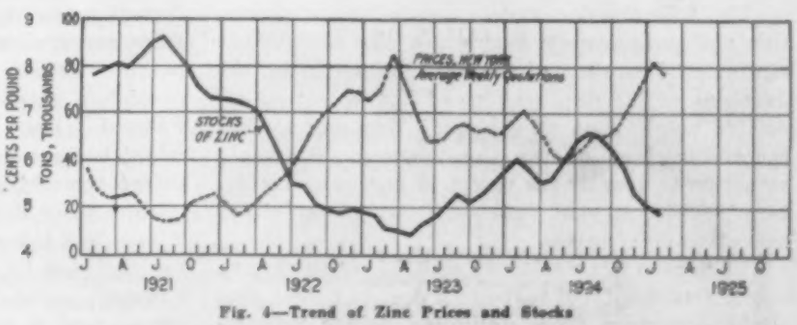

Fig. 4—Trend of Zinc Prices and Stocks

The curve of stocks is based on the reports of the American Zinc Institute and represents stocks at the end of each month. The prices are for spelter at New York and represent for each month an average of four weekly quotations as reported in THE IRON AGE

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Can Legislation Be Businesslike?

SENATOR GEORGE of Georgia, in commenting upon the speech of Vice-President Dawes, urging amendment of the rules of the Senate, said:

"Dawes comes in here from the business world, where there is impatience of restraint. Here deliberation is necessary as a check against hasty and ill-considered action, and to prevent the complete domination of executive authority."

To read the above comment, and that of other Senators, one would almost think that they considered it a grave offense for a man to leave the business world and make suggestions of businesslike procedure to an august Senate. The late Tom L. Johnson, who had extensive experience not only in politics as congressman and mayor of Cleveland, but in business as a steel manufacturer, used to say that executive ability consisted in acting quickly and being right half the time. That was, of course, an extreme statement which would not be approved by many industrial leaders. Johnson was a radical and most business men are reasonably conservative, but it is not unreasonable to demand that a legislative body so regulate its proceedings that action can be obtained at any time of the session by a majority vote.

The talk about complete domination of executive authority sounds very much like the denunciation of Lincoln which was indulged in by the Jacobins of his day, who stood in the way of effective prosecution of the Civil War and all but insured victory of the Confederacy. Such obstruction is usually the resort of men who are determined to prevent important action by either executive or congress.

The Senate is notoriously slow in responding to public sentiment, but respond it does in time. One slight departure from unlimited debate was attained after the action of a small coterie of Senators during the Wilson administration had disgusted the country. But that amendment did not go far enough. The Vice-President has, of course, no authority in the matter, but a man who has the ability, courage and boundless energy of Vice-President Dawes will be able to render his country great service in leading the movement for more businesslike methods in the Senate. The vast majority not only of business men, but of people in general, are with him and the issue which he so forcibly presented is bound to become one of increasing importance. The reform can be carried out without any danger of the adoption of gag rule which some of the Senators seem so greatly to fear.

Tax Exempt Securities

WITH the prospect that there will be further reduction in the Federal income surtaxes, the case of the tax exempt securities, issued by States, counties and municipalities, becomes less important, but what is of some concern is the rapid increase in the volume of these bonds. They promise to constitute a larger proportion, year by year, of the total securities in existence. The question of whether or not they ought to be taxed will not down.

The presentments commonly made in favor of a constitutional amendment removing the inhibition of taxes on these bonds have failed perhaps from assumed prudential reasons, to stress one point. The common argument is that these bonds furnish a means for the rich to avoid paying Federal taxes. If that were all, the rejoinder might be that the rich can be taxed hard enough to get something out of them anyhow.

The point that ought to be emphasized is that it is a bad thing for the progress of the country for the rich to own these bonds. To say this, however, is to say something good about rich people, and it requires a considerable amount of courage to do this. The rich are, in the main, men who have contrived and planned and developed. They have the ability or they would not be where they are. Secretary Mellon has said that the pres-

ent arrangement tends to dry up the sources of Federal taxes. That is true. It would not do for an official of the United States Government to say furthermore that the arrangement tends to dry up the brains of some of the most useful citizens of the country. Yet this is something that ought to be said, and said repeatedly without fear.

These bonds are safe and sound investments. For the common good, they ought to be owned by the widows and orphans and others who have not the ability to guide, plan and direct. The rich should be encouraged to use their brains, by the Government's ceasing to do what now in essence it is doing, discouraging them from taking an interest in industrial and development enterprises.

Sometimes an outcry is raised against the proposal to remove the tax exemption. A particularly lurid one appeared on the cover of a prominent trade paper recently, insisting that these bonds are issued largely to build schools, and this country needs schools and then more schools. Now, every tub should stand on its own bottom. Schools ought to be obtainable without Federal aid. If that is needed, why stop at this point—why not have an omnibus school bill in every Congress? These bonds are also used to build roads. If the roads will not pay for themselves in increased local prosperity, they ought not to be built. Federal aid is given to road building as it is, and it is done in such a way that everyone can see what is going on.

These bond issues are frequently submitted to popular vote, and it is often remarked that many who vote in favor have the mental conception that they are voting that money be spent rather than the conception that they are voting that they wish to be taxed. If it cost more to carry these bonds, they might not be in such favor at election time.

Concerning Some Railroad Affairs

RECENT incidents in connection with railroad transportation in this country afford material for some homely thoughts. They need not go into the abstractions of economic principles, though they may lead that way.

There has been a strong popular demand for abolition of the surcharge for transportation in Pullman cars. The railroads have resisted this, for it meant cutting their annual revenue by forty million dollars or so, which they cannot well stand. The Interstate Commerce Commission upheld them. The Senate then undertook to make the cut by legislation, but similar action was refused by the House.

Now, of course, the attempt to prescribe railroad rates by legislation was highly reprehensible. It is, moreover, true, without any doubt, that the railroad arguments in support of this surcharge are meritorious. Yet the popular resentment against it is well founded. It was a war-time innovation. The people who have to ride in Pullman cars feel that the railroads have maintained it owing to its being an easy way for them to get revenue. In other words, the railroad surcharge is somewhat akin to the income-tax surcharge. The railroads are not so much to be blamed as is the whole economic system of soaking the rich.

But in the course of time birds of ill omen come home to roost. The Boston & Maine Railroad, which gridirons northern New England, has many branch lines on which it does not run Pullman cars and they have been losing so much money that the company is seeking permission to abandon them. The Boston & Maine has 180 miles of branch lines that lose for it a half million dollars a year in direct operation.

Of course, the populace that makes use of these lines is resisting their discontinuance. This raises the questions: Must the owners of railroad property perform service at a loss in order to furnish convenience to the public if they do not want to? Would not constraint to that effect be equivalent to confiscation of their property? Would not the injustice be enhanced by the fact of the railroad operating loss being largely attributable to the behavior of the public itself?

It appears that the public in the territory affected prefers ordinarily to ride in automobiles and to have their freight carried by automobile trucks. The latter are operated on highways toward the upkeep of which they contribute but little and to a considerable extent none at all. However, automobiling is checked in bad weather, especially in winter, and the people want the railroads available for such times. Moreover, if the railroads be abandoned, how will many towns get in their coal and lumber? And how will some industries established along their lines ship out their goods?

It is a complicated problem, bristling with difficulties. The common-sense view is that if the public wants service it must pay remuneratively for it. Perhaps railroad rates should be raised. Perhaps truckmen should be caused to pay proper road charges, with the effect of diverting traffic back to the railroads. Perhaps the railroad should substitute motor cars for trains on its lines. Perhaps all of these things and others should be done. At present one part of the public is getting economic benefit for which it does not pay adequately; another part is getting remuneration that it does not earn; and another is paying the piper out of its resources. This is simply another version of taxing one class of people for the advantage of others.

Too Many Umpires, Too Many Coaches

AS business men become more concerned with achieving further economies in the operation of the industrial machine, they are becoming increasingly impatient with outside interference, whether it emanates from public or private sources. It is clear that sentiment has turned against excessive regulation of industry by Federal and State governments. There is also growing skepticism regarding private efforts, either individual or collective, to control or direct business in the name of progress.

It is, of course, not surprising that higher education, by emphasizing the dignity of the professions, is turning out an ever-increasing army of business specialists variously designated as con-

sultants, investigators, counselors, or engineers. We hear much of the "selling of ideas," the "putting over of drives," the establishment of this kind of a day, the inauguration of that kind of a week, or the pursuit of some new industrial research by a privately conducted bureau or an endowed foundation.

Obviously there will always be a need for trained leadership and skilled counsel in business, but the continuous bombardment from all sides has caused ennui to set in where responsiveness to new ideas formerly was the rule. In fact, an actual prejudice is developing against those who, though not actively engaged in business themselves, essay to tell others how to conduct theirs. In the vernacular of sport, the idea is taking root that there are not only too many umpires but too many coaches.

Iron Now in Use

IT would be impossible by a survey of what can be seen to make anything like a close estimate of the amount of iron, including iron in the form of steel, that is in actual service, in the United States, but an approximation can be made by considering the amount that has been produced and guessing how much has been lost.

The allowance for loss merely by age need not be large, for the bulk of our production has been recent. It has been generally recognized that the old "rule of doubling" in pig iron broke down some time ago, but the increase has been large. Mathematically, if production increases uniformly in such manner as to double every ten years, then the production in any ten years is precisely equal to all the production that preceded.

Total production of pig iron in the United States to the beginning of this year has been approximately 857,247,333 tons. A few million tons more than half of this has been made in the past 15 years, 1910 to 1924 inclusive.

There are good reasons for believing that the proportion of iron in service to total produced is higher now than at any time in the past. One reason is that when our production was light the things made from iron were widely distributed, hence it did not pay so well to gather old material. Furthermore, iron has been going into larger and larger things, and the larger the piece of old material the better it pays to go and pick it up.

It is true that in recent years we have exported a great deal of iron and iron products, but previously we had imported a great deal, and some of the old stuff survives. Trustworthy statistics of iron imports begin with 1871, but the statistics have not been complete. We have had nine years of imports of over a million tons actually recorded, 1871, 1872, 1880, 1881, 1882, 1886, 1887, 1902 and 1903. Even to this date the excess of exports over our previous imports is not a great many million tons, not enough to be considered when we are dealing with hundreds of millions of tons altogether, and can only approximate roughly how much has survived.

On account of the great usefulness of scrap in making open-hearth steel the collection of old material has been assiduous in recent years. Much of the pig iron made long ago, whether put into castings or into rolled iron, has gone through the remelting process and thus can be caught by observing the production of steel. The total production of steel ingots and castings up to the beginning of this year has been in the neighborhood of 725,000,000 tons. A trifle more than one-half of this has been produced in less than ten years, from the middle of 1915 to the end of 1924.

Rolled steel runs about 75 per cent of the weight of ingots produced, while there are some scrap losses in working up the rolled steel. Steel castings lose but little weight. It is practically certain that from 725,000,000 tons of steel ingots and castings more than 500,000,000 tons of things actually put into use resulted, or more than 250,000,000 tons in the past nine and a half years. Some things, like tin plate, hoops, etc., have a short life, but they are no large proportion of the total, and the waste in war lasted only a short time.

The great bulk of the 250,000,000 tons of steel articles made since the middle of 1915 is in use today. In addition we have the iron castings and rolled iron made in this period, and such of the material previously made as has survived. About 60,000,000 tons of foundry and malleable pig iron has been made in the past ten years. There is much tonnage of cast iron and wrought iron in use that is more than ten years old.

It seems clear that the amount of iron in various forms that is now serving the people in the United States is more, not less, than half a billion tons.

REPORTS of the projected building of dwellings in Glasgow, out of steel plates and other steel members, appear to have been made without taking due recognizance of the fact that organized labor in Great Britain wields a heavy hand. Negotiations were almost completed between the municipality of Glasgow and G. & J. Weir, Ltd., for the erection of twenty of these steel houses in that city. It develops now, however, that the municipality requires that building trade wages and other conditions established by the labor unions be complied with. The contracting firm has refused to accept the regulation of its methods and rates of payment and other matters of internal factory economy. It points out that such a course would not be helpful in furthering the solution of the housing problem, for only as such houses could be erected more rapidly or more cheaply, or both, would their construction be an economic benefit. Incidentally the British steel industry appears to be denied this item of consumption, not necessarily large in total tonnage but helpful none the less.

READERS of daily papers who are being regaled by sensational reports coming from the Couzens Senatorial committee will do well to reserve judgment in regard to numerous charges that are made. Certainly as to some companies a highly erroneous impression is likely to be created in the minds of many. In the case of the Steel Corporation, the problem of amortization was submitted to the Government officials and their solution was accepted by the corporation. If there was any error, it was one of judgment on the part of the officials.

FOREIGN TRADE QUIET

Far Eastern Business Confined to Large Companies —Imports by American Consumers Continue

NEW YORK, March 10.—Export trade with the Far East continues at about the same level as in recent weeks. The Chinese market has relapsed into dullness, offering prices of Chinese merchants being too low to interest most American sellers. Japanese inquiry is light, but there is a fair volume of pending business. On wire shorts, the American quotation is generally $45 a ton, f.a.s. Atlantic port, or higher, while the Chinese offers are, as a rule, less than $45 a ton. This divergence of price ideas is also noticeable in second-hand material. Offers by Chinese merchants of $25 a ton for second-hand plates, c.i.f. Chinese port, are generally several dollars a ton less than the lowest quotation exporters are able to make.

Railroad business continues a feature of Japanese activity. Although there are no large current inquiries from Japanese railroads, Japanese export houses have received information that the South Manchuria Railway Co. will ask for prices before long on 40 and perhaps as much as 100 miles of 100-lb. rails. The Imperial Government Railways may be in the market shortly for locomotive boiler tubes and superheater units. The largest recent order reported was the award of about 2400 tons of oil country pipe by the Nippon Oil Co., which placed 1300 tons with one prominent Japanese house and 700 tons with another. The exporter receiving the larger part of the award is understood to have been unable to accept the business. The opening date for the bids on the 10,000 tons of sheet bars asked for by the Kawasaki Dockyard Co. has been advanced to March 15.

The black sheet market is quiet, with British makers quoting several dollars a ton under the American mills. British mills are understood to have added about £1 to their price on light gage sheets, c.i.f. Japan, and are now quoting about $88 a ton, c.i.f., while the American market is reported at $93 to $95 a ton with possibility of securing a lower price on a good tonnage. It is claimed that a large Japanese export house recently placed about 200 tons of black sheets 27 to the bundle, with a prominent maker in the United States at a price close to $87 a ton, c.i.f. Japan.

Importations

The volume of imports of European finished material by American consumers continues fairly large. Tonnages of shapes and bars, which represent the major portion of such business, have been small but the effect is reported to have been sufficient to cause some uneasiness on the part of American makers selling to consumers along seaboard. It is claimed that billets have been obtained by importers from Belgium at as low as $29 a ton, c.i.f. Atlantic port, duty unpaid. The larger part of the present business seems to be coming from Belgium and France, German prices being too high to compete.

German importers and consumers are evincing considerable interest in machine tools and in addition to the business that has been transacted with German buyers in the past month or two, there is prospect of continued activity in certain types of automatic machinery, not made in Germany.

Third "Metal Committees Week" of A. S. T. M. in Philadelphia

The third "Metal Committees Week" of the American Society for Testing Materials will be held at the Bellevue-Stratford Hotel, Philadelphia, March 18 to 20. The 11 committees which have made plans to join in this gathering, are as follows:

A-1 on steel; A-2 on wrought iron; A-3 on cast iron; A-4 on heat treatment; A-5 on corrosion of iron and steel; A-7 on malleable castings; A-9 on ferroalloys; B-1 on copper wire; B-2 on non-ferrous metals and alloys; B-3 on corrosion of non-ferrous metals and alloys; E-4 on metallography.

The last meeting of this nature was held at Washington in October, with the first one in Pittsburgh early last year. Dr. Carl Benedicks, director of the Metallographic Institute, Stockholm, Sweden, is expected to address the members, probably at a special luncheon on Friday, March 20. On Thursday afternoon, March 19, arrangements have been made for an inspection of the new Delaware River Bridge. Informal dinners are being arranged for each evening, with the one on Friday enlivened by social and entertainment features.

Valve Standardization Conference Postponed

The decision to postpone indefinitely the conference on the standardization of valves, which has been under discussion during the past two years, has been announced by the American Engineering Standards Committee. The postponement is reported as having been taken as the result of a request to this effect by the Manufacturers' Standardization Society of the Valves and Fittings Industry.

"The subject of valve standardization originated with the American Engineering Standards Committee in a formal request by the Panama Canal in 1922," says the committee's statement. "Since that time there has been considerable correspondence in regard to the matter. For example, in reply to a questionnaire sent to members of the American Society of Mechanical Engineers requesting suggestions of subjects for simplification, standardization and simplification of valves was one of the items most often proposed. Practically all of the proposals have included the standardization of face to face dimensions in order to insure interchangeability of different makes of valves in pipe lines, and to make it possible, for example, to lay out pipe installations without the necessity of determining beforehand what make of valve is to be used.

"The action in postponing the conference is in accordance with the policy of the American Engineering Standards Committee that it will not act as an initiating body, and that it undertakes work on a project only upon a formal request by a responsible body and then only after the committee has assured itself that it is the consensus of industry that it is desirable that the work should go forward. Hence it was evident that the work of standardization could not be prosecuted successfully under the committee's procedure so long as the Manufacturers' Standardization Society of the valves and fittings industry is unwilling to enter a conference of all interested groups to discuss the advisability of undertaking the work and, in the case of affirmative decision, to decide along what lines the work should proceed."

Large Orders for Drop Hammers

CHICAGO, March 10.—Dodge Brothers, Detroit, have ordered from the Chambersburg Engineering Co., Chambersburg, Pa., 38 board drop hammers including five 1200-lb., 21 1600-lb., 10 2000-lb. and two 3000-lb. machines. The Endicott Forging & Mfg. Co., Endicott, N. Y., has placed orders with the Chambersburg company for one 1200-lb., one 2500-lb. and one 5000-lb. board drop hammers, the latter to be the largest board hammer yet built.

Production of electric power in January is reported by the United States Geological Survey at 5589 million kwhr., compared with 5545 in December and 5065 in November. Fuels provided for 3862 in January, compared with 3788 in December, while water power in January produced 1727, compared with 1757.5 in December. Consumption of fuel in January included 3,701,795 net tons of coal, 1,512,705 bbl. of fuel oil and 2,848,550 M. cu. ft. of natural gas.

PREMIUM ON IGNORANCE

John W. Davis Argues for Cement Association, Saying It Is Proposed to Sentence Business Men to Solitary Confinement

WASHINGTON, March 10.—Constituting what are in effect considered test cases as they relate to trade association activities, arguments were made before the United States Supreme Court last week in the so-called Maple Flooring and Cement Manufacturers' Protective Associations' suits. In both cases the Government is attempting to have the trade associations dissolved while counsel representing the associations put forth arguments for their preservation. By many it is considered that when the Supreme Court of the United States passes upon these two cases a rather definite code will be set up showing what trade associations may do safely within the law. By reason of this fact, business interests are hoping for comparatively early decisions. This seems to be the most practicable means by which the issue may be expected to be determined in the near future.

Efforts in the past to reach anything like definite conclusions have not been successful. There have been conferences on the subject of setting up a code participated in between such Government officials as Secretary of Commerce Hoover with representatives of various trade associations but when it was sought to even broadly outline activities which trade associations might do within the law, it has been found impossible to get the concurrence of the Department of Justice.

During the past year attempts again were made to have the latter assist in setting up standards and while the Department of Justice appeared to be inclined to do so, it never arrived at the actual point of working out the plan. There also was talk of trying a so-called test case, but this met with some objection and so was not done. The nearest approach to it, therefore, is in the two cases which were argued in the Supreme Court last week. Although they were not brought as test cases, their outcome, it is considered, will have the same effect as though they were instituted with this end in view. It is readily conceded that both the present cases may possess elements that are not common to many trade associations, but it is thought that the broad principles that may be evolved from them may be accepted as governing the general practice.

Special interest was shown in the arguments of the cement case. It was heard on appeal by the Cement Manufacturers Protective Association to have set aside a restraining order of the Federal District Court in New York, enjoining the association from continuing a number of trade practices. The association was repsented by Attorney John W. Davis. He maintained that if the action of the lower court were affirmed it would be necessary for the Supreme Court to interpret the Sherman law as seeking to place a premium upon ignorance among producers as to what is transpiring within their industry and "to sentence business men to solitary confinement."

It was argued by Special Assistant Attorney General J. A. Fowler that practices of the association were intended to give individual members control over the cement market. He argued also that the association maintained a black list and stifled all competition. Mr. Davis said that the Government had failed to produce any evidence to this end or to show that the association had engaged in any illegal practices. He insisted that the manufacturers had not by agreement or by any other means fixed prices or restricted production. On the contrary, he said, the association had only sought to learn the standing of prospective customers, the extent to which there had been duplication of contracts, and to place in available form for salesmen the freight rates applying to cement.

Mr. Davis said that the association had gathered statistics showing stock on hand at the close of the previous month and related data which were entirely proper and were necessary for any wide awake producers to have. It was argued that there was no information circulated among members regarding probable demand or prices or other subjects that would be in violation of law.

GLOOMILY PICTURED

Soft Coal Trade as Described by President Warden of Pittsburgh Company

A typical picture of the soft coal industry is presented in the annual report of the Pittsburgh Coal Co. In commenting upon trade conditions W. G. Warden, chairman, says:

"In the history of your company there has never been a year in which the marketing of its production was as difficult as in 1924. The large stocks of bituminous coal accumulated by consumers in 1923 depressed the market. These stocks were not materially reduced during the year. Competition was vigorous throughout the period for there was no trace of interference with production and transportation of bituminous coal; the supply was far in excess of demand at all times. Price rather than quality determined sales.

"The prices at which soft coal was sold in 1924 were fixed by the producers with lowest costs of production, that is to say, those in other fields, notably in southern West Virginia and eastern Kentucky, employing non-union labor, the wages of which were reduced in 1924 materially below the union scale. A measure of the difference in costs of production—union vs. non-union—is found in the fact that your company bought several million tons of non-union coal for the Lake trade of its affiliated dock companies in the Northwest at an approximate average price for mine run coal at $1 per ton below the costs at its mines in the Pittsburgh district, from which it has heretofore shipped the coal for that trade.

"At the end of 1924 this company had 70 mine plants of which three were leased for operation by others, two having been abandoned and dismantled during the year. Of these, 56 are in the Pittsburgh district, 13 in Ohio and 1 in Kentucky. In the Pittsburgh district 25 mines were idle the entire year, and 9 from April to the end of the year. In Ohio 5 mines were operated for a short period early in 1924 and subsequently all were idle. Full time capacity of these 70 mines with the labor supply available is estimated at 23,000,000 tons. Production represented 39 per cent of this total; 12 per cent was lost because of lack of orders to fully employ the mines that were in operation; and the mines shut down represented 49 per cent of the capacity."

Heavy Car Loadings

Car-loading records continue to be broken. For the first nine weeks of the year the total was 8,070,319 cars, a figure never before reached at this season. It compares as follows:

1924	7,926,089	1921	6,274,360
1923	7,764,188	1920	7,195,211
1922	6,623,809	1919	6,357,233

The Standard Forging Co., Chicago, has organized a subsidiary company, the St. Louis Forging Co. Officers of the two organizations are practically the same. The St. Louis Forgings Co. has acquired a forging plant located at East St. Louis, Ill., formerly owned and operated by the LaClede Steel Co., St. Louis. The plant will be continued in the production of car and locomotive axles and forgings. The company has also established an office at St. Louis. George E. VanHagen, Railway Exchange Building, Chicago, is president.

BUYING LIMITED

Considerable Tonnage in Youngstown District Will Be Carried Into Second Quarter

Youngstown, March 10.—Second quarter steel buying is still marked by some irregularity in this district, reflected in current production schedules which show weakness in finished steel lines. Mills prefer to curtail rather than accumulate and stock output. Current slackness in some steel products is a natural result of substantial overbuying in December and January, when steel consumers came into the market in a generous way and made liberal purchases in order to benefit from the low prices prevailing at that time.

Following a long period of intermittent buying, steel makers were anxious for business and accepted contracts. As a result, sizable tonnages remain unfilled on contracts negotiated earlier in the year. New buying at present is therefore in restricted volume. From present indications, there will be a substantial carryover from the first to the second quarter.

Buying for the next quarter is not expected to develop in volume until perhaps the end of March or some time in early April.

There has been keener competition in the sheet market in this district than in any other finished steel product, because of the substantial producing capacity. Smaller, non-integrated rollers have been anxious to keep their order books well filled, and price weakness has developed.

However, the current situation is characterized by district producers as entirely normal, lacking in any influences which might prove demoralizing. While February shipments fell below those of January with most interests in this territory, March is expected to show improvement over the preceding month. Opening of the weather will bring with it a much larger volume of business, the steel companies feel.

CENTRAL STEEL CO. REPORT

Past Year Most Satisfactory Company Has Had Since Merger

The Central Steel Co., Massillon, Ohio, in its annual report for 1924 shows gross earnings of $4,966,637. Reserve deductions included $720,000 for depreciation. In addition there was absorbed in operating costs during the year repairs amounting to $1,155,469. The total net earnings were $2,899,823 as compared with $2,006,953 in 1923. After deducting dividends the balance transferred to the profit and loss account amounted to $1,426,573. Sales during the year were $30,677,856 as compared with $34,720,158 in 1923.

R. E. Bebb, in his annual report as chairman of the board of directors, states:

"The past year has been the most satisfactory one the company has enjoyed since the merger of the three companies under one management. In the concluding months of the year 1923 automobile manufacturers anticipated future demands with a heavy production program, and to such an extent that, while 1924 opened very auspiciously, after February there ensued a decreasing demand owing to accumulated stocks which in turn was reflected in the demand for our products. The decline continued through the month of June, during which we operated on about a 50 per cent basis. In July business began to show improvement, which continued throughout the remainder of the year. There was no preliminary spurt like that of a year ago, and in consequence, while we are expecting about the same volume for 1925, we believe it will be more evenly spread through all the months of the year, giving us more desirable operating conditions.

During the year 1924 we showed an average operation of 6.8 of open-hearth furnaces as compared with 7.1 in 1923, with a production of ingots of 331,312 tons as compared with 334,695 tons for 1923. Our new bar mills again proved their worth in most successful operations both in the quality of production and low production costs. In the sheet mill division we had production of 58,097 tons as against 60,842 tons for 1923. In the National strip division, our production was 79,642 tons as compared with 79,795 tons for 1923.

During the greater part of the past year overproduction as compared with the demand caused steadily declining prices on our products. Competition was very keen and the spread between costs of raw materials and finished production was smaller than any year in our history. Notwithstanding this fact, due to improved operating conditions, our earnings were maintained, which means that we showed fewer manhours per ton of production with an increased per cent of good practice. This reduction in costs was not produced by means of reduced wages, as our record shows that the average wage per employee for 1924 was $33.57 greater than in 1923.

Our outstanding accomplishment during the year was the standardization of our sheet mill division, which had showed us a steady loss each month during the last half of 1923. Nineteen twenty-four showed very considerable increase in profits in this division, as is also true in the Central division; while the tonnage in the National division was practically the same as the preceding year, our earnings were reduced about 20 per cent. Whenever the markets in this product are very low, we have to compete with skelp and plate mills, which makes competition very hard for a strip mill producing a commodity on a quality basis.

"Some time ago we reorganized our safety department, receiving the full benefit of its improved operations in 1924. As compared with 1923 the total number of accidents was reduced one-fourth. In 1924 there were only 261 accidents which caused lost time as against 447 for 1923.

"About two years ago we inaugurated a research and sales department, pertaining to the substitution of alloy for carbon steels. We are much encouraged through the results shown and believe that the possible market for alloy steels has only been worked on the surface so far and within the next ten years practically every industry using steel will be forced, through competition, to exploit alloy steel in their products."

Readjustment in Trumbull-Cliffs Furnace Co. Stock

Plans have been announced for the redemption April 1 at 107 of preferred stock of the Trumbull-Cliffs Furnace Co., joint subsidiary of the Trumbull Steel Co., Warren, Ohio, and the Cleveland-Cliffs Iron Co., Cleveland. Present 8 per cent preferred stock will be replaced by 6 per cent preferred. The Trumbull company at Warren is half owner of the common stock of the furnace company, and besides owning some of the preferred stock, has an option to buy the property. Of the original issue of $4,500,000 cumulative preferred stock, about $500,000 has been retired in the past two years, since the stack has been in commission, leaving about $4,000,000 outstanding to be refunded into the proposed issue.

The company's stack during its first year's operation produced 252,000 tons of iron, a daily average of nearly 700 tons.

"The Design of Specimens for Short-Time Fatigue Tests" is the title of Technological Paper No. 275 of the Bureau of Standards, by L. B. Tuckerman, engineer physicist, and C. S. Aitchison, assistant mechanical engineer of the Bureau. It discusses the controlling factors in the design of short-time fatigue test specimens, which differ from those of the endurance-run type of fatigue tests.

Iron and Steel Markets

PRICES CRYSTALLIZING

Forward Business at Current Levels

Some Curtailment in Pig Iron and Steel Production—Pig Iron Lower

Under-surface developments give signs of price stability at prevailing levels for second quarter shipments in the heavy tonnage steel products. The fact that the rather general $2-a-ton advance attempted in January applied to few and on no sizable sales is not taken to mean there has been a price recession or that there is price weakness of the kind inviting hesitation.

Adding to tonnages on present quarter contracts against which rollings will not be made before April 1 fresh buying for concrete reinforcing steel was done at 2.10c., Pittsburgh. Round tonnages of plates were covered at 2c., including a few thousand tons for railroad cars and several hundred tons for steam boilers. The leading oil company has taken an option at the same price on several thousand tons. First quarter prices have ruled on alloy steel orders of the past week. In Chicago prevailing prices have likewise been established by numerous sales.

In sheets and wire no test is being made, seeing that independent sheet mills have difficulty in maintaining 60 per cent operations or in scheduling a week's rollings, and wire mills still are engaged on orders taken at lower than today's prices.

Adjustment between production and consumption is shown by a further curtailment in operations in the Youngstown district, where sheets are a large factor. Two Youngstown and two Buffalo blast furnaces have been banked. In the heavier steel products in Chicago, however, 100 per cent activity is still the order.

The steel ingot production of February, at 155,800 tons a day, is less than 1 per cent increase over the daily average in January. February operations were at a rate of about 89½ per cent of capacity compared with 89 per cent for January, but the peak point, reached in March, 1924, was a 93 per cent rate.

In line with the showing by the United States Steel Corporation of an increase in unfilled orders on Feb. 28 of over 247,000 tons, on top of the increase of 221,000 tons at the end of January, is the recording of bookings of large independent steel companies for the first third of March only a few per cent under the amount taken in the same period of February.

The weakness in sheets has been accentuated by low prices obtained by automobile makers, who are not buying for more than April needs. As low as 4.40c. has again been done on automobile body sheets. Black sheets for immediate shipment brought 3.25c., with 3.50c. substantially a maximum price. Galvanized sheets are easy to get at 4.65c. Makers of sheet bars are finding it difficult to raise buyers' offers of $37.50 a ton.

On wire rods $48 is not necessarily a minimum. Jobbers are allowing low price nail contracts to lapse, on the score of lack of storage space.

Railroad equipment business is not up to expectations, though 1700 cars were bought and close to 4000 were offered for estimates, including 3400 for the Southern Pacific. Fifty locomotives were purchased. As to rail buying, there is no doubt. Fresh orders for 6800 tons of rails and for more than 9500 tons of track supplies were reported from Chicago. Releases of rail specifications from 10 roads in the past week covered 30,000 tons.

The principal items in the structural field are an award of 6000 tons for mill buildings for the McKinney Steel Co. and large projects in both Chicago and New York about to come into the market.

That tin plate consumption may meet the estimate of exceeding the average of the past two years by 10 per cent is helped by a supplemental order for 200,000 base boxes received from a Pacific Coast can maker for the fish packing industry.

The new development in pipe is a few cases of jobbers' receiving consigned stock accounts. Buyers have no notions of higher prices ahead or fears of difficulties in deliveries. New prices on seamless pipe represent a slight advance over the low point late last year.

The buying of 20,000 tons of pig iron in the Pittsburgh district by a sanitary company and about 10,000 tons in the East by soil pipe companies was done at concessions of 50c. per ton on foundry grades. The market is weak in nearly all centers, but in the Chicago district sellers have so far been able to resist pressure of buyers. Foreign iron continues to be a factor, but at its present prices is little below those of domestic iron in the East.

Some blast furnace operators having contracts with a wage clause have been paying more than $1 additional for coke since independents adopted the Frick scale last December, but it is now expected that the independents will return next Monday to the lower coke wage scale of November, 1917. Owing to ample labor supply, no serious difficulty in reducing wages is feared.

THE IRON AGE composite pig iron price is $22.13 per gross ton, compared with $22.25 last week and $22.50 two weeks ago.

Pittsburgh

Improvement Not Strong Enough to Establish Recent Price Advances

PITTSBURGH, March 10.—While the demand for some steel products is slightly better than last week or the week before, it is quite evident that the improvement has not been of proportions to give strength to the price ideas of the manufacturers. The resistance which they encountered to the most recent advance of $2 a ton has been so great that there are now very few instances where this advance is being insisted upon. The last advance in sheets has definitely gone into the discard and in plates, shapes and bars the prevailing prices are those of early January. Still being engaged on the production of lower priced business, the opportunity has not yet presented itself for a test of present quotations on wire products. Cold-finished steel bars

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 10, 1925	Mar. 3, 1925	Feb. 10, 1925	Mar. 11, 1924
No. 2X, Philadelphia‡	*$24.26*	$25.01	$25.01	$24.13
No. 2, Valley Furnace†	*21.00*	21.50	22.00	23.00
No. 2, Southern, Cin'ti†	24.05	24.05	24.05	26.55
No. 2, Birmingham, Ala.†	20.00	20.00	20.00	22.50
No. 2 foundry, Chicago*	24.00	24.00	24.00	24.50
Basic, del'd, eastern Pa.	23.75	23.75	23.75	21.50
Basic, Valley furnace	21.50	21.50	22.00	22.00
Valley Bessemer del. P'gh.	24.26	24.26	24.76	25.26
Malleable, Chicago*	24.00	24.00	24.00	24.50
Malleable, Valley	21.50	21.50	22.00	22.50
Gray forge, Pittsburgh	*22.26*	22.76	23.26	23.76
L. S. charcoal, Chicago	29.04	29.04	29.04	29.15
Ferromanganese, furnace	115.00	115.00	115.00	107.50
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	37.00	37.00	37.00	40.00
O.-h. billets, Pittsburgh	38.00	38.00	38.00	40.00
O.-h. sheet bars, P'gh.	38.00	38.00	38.00	42.50
Forging billets, base, P'gh.	42.50	42.50	42.50	45.00
O.-h. billets, Phila.	41.67	41.67	41.67	45.17
Wire rods, Pittsburgh	48.00	48.00	48.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh. lb.	2.10	2.10	2.10	2.30
Light rails at mill	1.80	1.80	1.80	2.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.28	2.28	2.28	2.57
Iron bars, Chicago	2.10	2.10	2.00	2.40
Steel bars, Pittsburgh	2.10	2.10	2.10	2.40
Steel bars, Chicago	2.20	2.20	2.20	2.50
Steel bars, New York	2.44	2.44	2.44	2.74
Tank plates, Pittsburgh	2.00	2.00	2.00	2.40
Tank plates, Chicago	2.30	2.30	2.30	2.60
Tank plates, New York	2.34	2.34	2.34	2.64
Beams, Pittsburgh	2.10	2.10	2.10	2.40
Beams, Chicago	2.30	2.30	2.30	2.60
Beams, New York	2.44	2.44	2.44	2.69
Steel hoops, Pittsburgh	*2.40*	2.50	2.50	3.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Mar. 10, 1925	Mar. 3, 1925	Feb. 10, 1925	Mar. 11, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.50	3.50	3.50	3.75
Sheets, black, No. 28, Chicago dist mill	3.70	3.70	3.70	...
Sheets, galv., No. 28, P'gh.	*4.65*	4.75	4.75	4.90
Sheets, galv., No. 28, Chicago dist. mill	4.85	4.85	4.85	...
Sheets, blue, 9 & 10, P'gh.	2.70	2.70	2.70	2.90
Sheets, blue, 9 & 10, Chicago dist. mill	2.80	2.80	2.80	...
Wire nails, Pittsburgh	2.85	2.85	2.85	3.00
Wire nails, Chicago dist. mill	2.95	2.95	2.95	...
Plain wire, Pittsburgh	2.60	2.60	2.60	2.75
Plain wire, Chicago dist. mill	2.70	2.70	2.70	...
Barbed wire, galv., P'gh.	3.55	3.55	3.55	3.80
Barbed wire, galv., Chicago dist. mill	3.65	3.65	3.65	...
Tin plate, 100 lb. box, P'gh.	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	*$17.50*	$18.50	$19.50	$20.50
Carwheels, Philadelphia	*18.50*	19.00	19.50	19.00
Heavy steel scrap, P'gh.	18.50	18.50	20.00	20.00
Heavy steel scrap, Phila.	16.00	16.00	18.00	17.00
Heavy steel scrap, Ch'go	*17.00*	17.25	17.50	17.00
No. 1 cast, Pittsburgh	19.00	19.00	20.50	20.50
No. 1 cast, Philadelphia	18.00	18.00	19.00	18.50
No. 1 cast, Ch'go (net ton)	18.50	18.50	18.50	20.50
No. 1 RR. wrot. Phila.	19.00	19.00	20.00	19.00
No. 1 RR. wrot. Ch'go (net)	*15.00*	15.50	16.00	14.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$3.50	$3.50	$3.75	$4.15
Foundry coke, prompt	4.25	4.25	4.25	5.00
Metal,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*14.62½*	14.75	15.12½	14.25
Electrolytic copper, refinery	*14.25*	14.37½	14.62½	13.75
Zinc, St. Louis	**7.35**	7.30	7.55	6.55
Zinc, New York	**7.70**	7.65	7.90	6.90
Lead, St. Louis	8.75	8.75	9.37½	9.50
Lead, New York	9.00	9.00	9.55	9.50
Tin (Straits), New York	53.37½	54.87½	57.12½	58.50
Antimony (Asiatic), N. Y.	16.00	16.00	20.00	11.25

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

THE IRON AGE Composite Prices

March 10, 1925, Finished Steel, 2.546c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

March 3, 1925,	2.546c.
Feb. 10, 1925,	2.546c.
March 11, 1924,	2.746c.
10-year pre-war average,	1.689c.

March 10, 1925, Pig Iron, $22.13 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

March 3, 1925,	$22.25
Feb. 10, 1925,	22.50
March 11, 1924,	22.86
10-year pre-war average,	15.72

	High 1925	High 1924	High 1923		Low 1925	Low 1924	Low 1923
Finished Steel	2.560c., Jan. 6	2.789c., Jan. 15	2.824c., April 24		2.546c., Feb. 3	2.460c., Oct. 14	2.446c., Jan. 2
Pig Iron	$22.50, Jan. 13	$22.88, Feb. 26	$30.86, March 20		$22.13, March 10	$19.21, Nov. 3	$20.77, Nov. 20

have eased back from 2.80c., base Pittsburgh, to 2.70c., the price at which practically all of the business for this quarter was taken.

In view of the fact that the last advance in steel prices now appears to have been a mistake, the important consideration is as to the effect the recession from the advance will have upon the demand. If any considerable part of the production has gone into stock, buyers may be able to live off their reserves without additional purchases for a while. There is no concrete evidence that the automobile industry is yet materially increasing its production schedule or its consumption of steel, but in view of the fact that the weather is becoming favorable, a sudden change for the better will not be surprising. Railroad equipment business so far as local shops are concerned has not been up to expectations and one of the companies lately has been laying off men in large numbers with the depletion of its orders. There seems to be no doubt about the rail laying program of the railroads with its demand for rails and accessories and favorable weather is stimulating the construction work and the movement of structural steel. The most favorable outlook in any of the steel products just now is in tin plate, all makers of which are very heavily booked, and as a result of a record pack of fish on the Pacific Coast this year, one of the large can companies found it necessary to supplement first half purchases by 200,000 base boxes. Fall dating on woven wire fence has appeared in the South.

There is somewhat more stability in the primary materials than was the case recently. A large purchase

of foundry iron for second quarter shipment appears to have established the market at $21, Valley furnace, for the base grade. For the second week running, scrap prices have shown no decline, and while consumptive buying is still light, dealers with old unfilled orders are giving the market a measure of strength by their efforts to cover. The market also derives its strength from the fact that offerings of scrap are not at all free at present prices. It now appears that the Connellsville district coal and coke producers who raised wages last December to the Frick scale, after having been at the November, 1917, scale for about six months, will go back to the latter scale March 16. With the wage situation less of a factor, the price of coke for second quarter shipment has become fairly clearly defined and the passing of uncertainty as to fuel costs naturally is helpful to the pig iron market.

While there has been some further slight recession in plant operation in the Youngstown district, including the banking of two blast furnaces, the activities of Pittsburgh and Wheeling plants are holding well up to the recent gait. The Youngstown district runs so heavily to sheets that the present depression in that product is fully felt.

Pig Iron.—The Standard Sanitary Mfg. Co. late last week closed for 20,000 tons of foundry iron for its Pittsburgh and New Brighton, Pa., plants for second quarter shipment, distributing the business among four producers at $21, Valley furnace, or Valley furnace base for No. 2 iron. This company is yet to buy about 14,000 or 15,000 tons of iron for its Louisville, Ky., plant for second quarter shipment. This purchase is deferred because the buyer regards the present price of Southern iron as too high and there is an intimation that southern Ohio iron will be bought more heavily for Louisville than usual on the score of a lower delivered price. The company also is to buy iron for its Baltimore plant, which at present is melting about 35 tons a day. The Valley market for foundry iron is established at $21 for No. 2 grade by this business, the new price representing a drop of 50c. a ton from last week's level and of $2 a ton from the price at which a few scattering small lot tonnages were moved at around the first of the year. A price of $22.50 Valley furnace for Bessemer iron is based on two small sales. One merchant furnace interest has expressed a willingness to take business in this grade at $22 and it is reported that an even lower price is named against a recent inquiry for 1000 tons by a Pittsburgh maker of rolling mills and rolling mill equipment. The quotation of $21.50, Valley furnace, on basic iron has found no basis in sales in the past week and it is believed it would be shaded on the appearance of an inquiry of any considerable size. Malleable iron does not appear to be very plentiful and is not yet available at less than $21.50 Valley. The Youngstown Sheet & Tube Co. has banked one furnace and will shortly add another to the idle list, having stopped coke shipments.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$21.50
Bessemer	22.50
Gray forge	$20.50 to 21.00
No. 2 foundry	21.00 to 21.50
No. 3 foundry	20.50 to 21.00
Malleable	21.50 to 22.00
Low phosphorus, copper free	29.00

Ferroalloys.—German ferromanganese continues available at $110, c.i.f. Atlantic seaboard, and small sales are reported, but apparently the offering of this relatively low-priced material is having no effect upon either prices or consumption of domestic and British material, as recent prices are holding and the report is that specifications on contracts are free. Most consumers in this and nearby districts are covered against probable requirements for at least the first half of this year and some for an even longer period and practically none of the tonnage is at a higher price than $110, seaboard. Business in other ferroalloys is almost entirely in deliveries against old orders. Prices are given on page 803.

Semi-Finished Steel.—Current demands are light and as makers of sheets and strips who buy their steel will carry some first quarter tonnage into the second quarter, they are not yet keenly interested in billet, slab and sheet bar requirements for that period. With sheet prices yielding and strength lacking in strips, which constitute the chief outlet for commercial billets and slabs, the nonintegrated manufacturers naturally regard present asking prices as too high. There continues to be an asking price of $39, f.o.b. Pittsburgh and Youngstown for sheet bars, but so far as sales are concerned the market is more properly quoted at $38, f.o.b. Pittsburgh, and that price also is being named by some makers to get early shipment business to offset the suspensions that have been coming in lately. No suspensions are reported against billet contracts, but there are some makers who are yet to receive specifications against all of the tonnage sold for the present quarter. Not enough business is being done in skelp to clearly define prices, but not much business was placed at higher than 2c. and that represents the general maximum on current shipments. On rods now leaving the mills $48, base Pittsburgh, is not minimum, although on new business it is claimed that $48 and $50 are being obtained, and one lot of 200 tons of screw stock rods has been sold at $50 base. Prices are given on page 803.

Wire Products.—Mills in this district are well engaged, but it is chiefly on old orders placed at prices well below those of today, specifications against which were stimulated by the last advance in quotations about a month ago. There are some cases locally of jobbers being so well stocked that they have allowed low-priced contracts for nails to expire because they lacked storage space and consumption has not gained to an extent that has made possible much reduction of stocks. So far as the current shipments are concerned the market here is still close to $2.75 base, per keg for nails and $2.50 base, per 100 lb. for plain wire; contracts carry prices $2 per ton higher, but being well supplied with lower-costing goods, jobbers are not yet obliged to specify heavily against such contracts. New business generally is light and shipments are somewhat ahead of incoming business. Fall dating now is in effect in the South on fence and probably soon will become effective in other portions of the country. Prices are given on page 802.

Rails and Track Supplies.—The approach of the track laying season is stimulating specification against contracts for spikes and other track supplies, but there is not much new business and manufacturers are steadily cutting into their backlogs. This probably explains some nonobservance of what are regarded as market prices. The market is not firm at $2.90, base, per 100 lb. on large spikes and on tie plates, 2.35c. is the more common price. There is no improvement in the demand for light rails and prices are barely maintained. Standard rail business is good and specifications suggest a good movement this coming spring and summer. Prices are given on page 802.

Sheets.—There is now general admission that the advance of $2 a ton announced late in January to apply on second quarter business is noneffective and that the market for that delivery is quotable at the former prices, or from 3.50c. to 3.60c., base Pittsburgh, for black, 4.65c. to 4.75c. for galvanized, and 2.70c. for blue annealed. Automobile body sheets are 4.60c., base (No. 22 gage) as a maximum, with 4.50c. also showing and even lower prices have been noted on some recent business of attractive proportions. There has been palpable overproduction of sheets in the past 90 days and then there have been sales activities of the smaller producers, whose need of orders has been so constant that even when the larger producers were advancing prices they were still cutting in the effort to get an economical operation. The yielding tendency of prices is having the usual effect upon demand and there are some mills that are finding it difficult to schedule more than a week ahead. Operations of the sheet industry as a whole are not running much more than 70 per cent of capacity and the outlook is for a lower rate because of the unsettled price situation, which may be counted on

to make buyers cautious. Prices are given on page 802.

Tin Plate.—All signs continue to point to a good year in tin plate. One of the can companies has just placed with the American Sheet & Tin Plate Co. a supplemental order for 200,000 boxes for first half of this year shipment. This is a reflection of the fact that the pack of fish this year has been of record proportions. Present estimates of the can companies are that this year's requirements will be at least 10 per cent greater than the average of 1923 and 1924. Tin plate mills are operating fuller and have more business in sight than is true of any other branch of the steel business. The price is unchanged at $5.50 per base box, Pittsburgh, for standard cokes for domestic account and unless the prices of sheet bars or tin go materially higher than they are today it is probable that this price will rule in the last half of the year.

Cold-Finished Steel Bars and Shafting.—The need of new business is beginning to be felt by some makers, and buyers with worthwhile tonnages to place lately have had no trouble in finding producers willing to continue the price at which the bulk of current shipments are priced, or 2.70c., base, Pittsburgh. The price of 2.80c., base, Pittsburgh, to which makers here advanced after taking large first quarter tonnages at 2.70c., still is quoted, but appears to be obtainable only on small tonnages.

Hot-Rolled Flats.—There is not enough business in hoops, bands and strips to go around among all makers and in view of the revised card of extras which raised costs on some of the popular sizes, some difficulty is being experienced in maintaining base prices. The market on all three products is quotable from 2.40c. to 2.50c., but in a general way 2.40c. is the ruling maximum. Prices are given on page 802.

Iron and Steel Bars.—Steel bars have pretty generally settled back to 2.10c., base Pittsburgh. There has been some small lot business at 2.20c., but lately mills still quoting that price have lost business. Makers of iron bars are holding to recent quotations. Prices are given on page 802.

Structural Material.—There is no longer a real serious effort on the part of mills here to secure 2.20c. base for large structural beams. As a matter of fact, no business worth noting has been taken at that price and fabricators who have any worthwhile orders to place do not have to figure on paying more than 2.10c. Open weather has stimulated both the demand for fabricated steel and shipping instructions against old orders. Plain material prices are given on page 802.

Plates.—The market has receded from the maximum of 2.20c., base Pittsburgh, to 2.10c. On the small lot orders, that price probably can be done, but on worthwhile tonnages the market is more accurately quoted at 2c. The market lacks the benefit of a sizable demand from the usual consuming sources and the fact that the pipe market is not especially active. Prices are given on page 802.

Tubular Goods.—The past week has seen a pausing in the demand for pipe and a slight tapering in operations at independent mills. Until recently shipments of buttweld pipe were running well up to production, but lately the makers have been able to maintain operations only by stocking some of the production. There is evidence that jobbers are well stocked in view of the fact that secondary market weakness still is noted and to escape losses some jobbers have asked the mills for consigned stock accounts. Lapweld pipe is doing fairly well on current sales, but the notion is strong that higher prices are not ahead nor is there a fear about deliveries to make distributors uneasy. New prices have appeared on seamless tubes, which show a substantial reduction as compared with former published quotations, but show a slight recovery from the low point reached late last year. The reductions bring four cold-drawn commercial tubes 50 per cent off lists as against 41 to 44 per cent and the same size of hot-rolled tubes to 53 per cent off list against the former quotations of 43 to 46 per cent. In money this is a cut of $12 to $20 a ton. Mechanical tubing is 1c. to 5c. per foot lower. Discounts and prices are given on page 802.

Bolts, Nuts and Rivets.—Matters still are slow with makers in this district. Buyers are inclined to withhold specifications against first quarter bolt and nut contracts, presumably with an idea of getting shipments in the second quarter on a freight allowed basis and thus saving the freight. No second quarter business of importance is being placed. Prices are merely steady and there are concessions on large lots. Rivet business also is light and prices are not very strong, especially on lots of a carload or more. Prices and discounts are given on page 803.

Cold-Rolled Strips.—The continued absence of the automotive industry as a buyer keeps down the volume of business and weakness in full finished sheet prices is a factor in prices of cold-rolled strips. The market still is quotable at 4c. to 4.15c., base Pittsburgh, but the latter price is both maximum and extreme.

Coke and Coal.—Increased interest in second quarter tonnages of coke is noted because it is fairly apparent that independent Connellsville operators will go back to the November, 1917, wage scale beginning next Monday and this has made possible more definite second quarter prices than recently were possible. The past week or ten days has brought a considerable curtailment in production through the banking of two Youngstown and two Buffalo furnaces and with the H. C. Frick Coke Co. operating at a rather low rate, the labor supply is ample and no trouble is expected to follow the application of the reduced wages. Some second quarter business has been taken on contracts containing a wage clause that gives the buyers the benefit of the wage reduction, while other contracts have been written with no reference to wage scales. In either case buyers will secure second quarter furnace coke at about $3.50 per net ton at ovens. Quotations on pending business range somewhat higher, but it looks as though the bulk of second quarter coke could be at about that level. The spot market still is quotable from $3.50 to $3.75, but the latter price is now rather hard to obtain. Foundry coke is priced all the way from $4.25 up to $5.50, but $4.75 measures the more common top. The coal market still is dull and weak.

Old Materials.—The fact that another week has gone by with no decline in prices strengthens the belief that the market for the present has struck bottom. There is no consumptive buying of any account, but selling pressure is light because dealers are finding the offerings much lighter than they were a short time ago. Producers of scrap seem inclined to let the material accumulate rather than let it go at current prices and dealers who still have some high-priced orders to fill are finding low bids futile. It is noted that the scrap of the Pennsylvania Railroad averaged less than $1 a ton below the prices of last month and that the heavy melting steel brought $19.76, delivered at Vandergrift, Pa. In view of the decline in market prices over the past 45 days, a greater decline in railroad scrap was expected.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel	$18.50 to	$19.00
No. 1 cast, cupola size	19.00 to	19.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	20.50 to	21.00
Compressed sheet steel	17.50 to	18.00
Bundled sheets, sides and ends	16.50 to	17.00
Railroad knuckles and couplers	21.50 to	22.00
Railroad coil and leaf springs	21.00 to	21.50
Low phosphorus blooms and billet ends	24.00 to	24.50
Low phosphorus plate and other material	23.00 to	23.50
Railroad malleable	18.00 to	18.50
Steel car axles	21.50 to	22.00
Cast iron wheels	19.50 to	20.00
Rolled steel wheels	21.50 to	22.00
Machine shop turnings	14.00 to	14.50
Short shoveling turnings	14.00 to	14.50
Sheet bar crops	20.00 to	20.50
Heavy steel axle turnings	18.00 to	18.50
Short mixed borings and turnings	14.00 to	14.50
Heavy breakable cast	17.00 to	17.50
Stove plate	16.00 to	16.50
Cast iron borings	14.00 to	14.50
No. 1 railroad wrought	15.00 to	15.50
No. 2 railroad wrought	18.50 to	19.00

Chicago

Concrete Bar Contracts Made, but Most Buyers Are Apathetic

CHICAGO, March 10.—Another week has passed without developing any new trend in the finished steel market. Nothing resembling a general buying movement for second quarter has set in, although the concrete bar distributors, who form an important class of users, have contracted for their needs over that period.

In view of the apathy among most buyers, the position of the mills rolling heavier products is still surprisingly favorable. One important local producer showed another encouraging increase in unfilled tonnage in February and even now is booking new business slightly in excess of its shipments. Commitments in soft steel bars are especially heavy and new orders continue to come in, the bookings of one mill for the week amounting to 12,000 tons. On structural shapes, however, local capacity is catching up on shipments with the result that fairly satisfactory deliveries are again available. On plates, owing to the decline in railroad car and oil storage tank buying, early shipments are to be had. Signs of a revival in plate business are seen in a fresh expansion of railroad purchases. Just as carriers appeared to have lost interest in rolling stock, the Southern Pacific has entered the market for 3400 freight cars. Likewise a number of fair-sized car orders have been placed during the week, among them 750 cars ordered by the Monon, 500 purchased by the Burlington and 300 contracted for by Swift & Co. The steel required for the 1550 cars, amounting to 16,000 tons, will undoubtedly be furnished by local mills. A Chicago producer has also booked 4000 tons of plates from various railroads, which is an impressive tonnage, considering the fact that the carriers' direct purchases of plates are not heavy. Fresh orders for rails aggregate 6800 tons, while more than 9500 tons of track supplies have been booked. Releases against rail and fastening contracts are also heavy, rail specifications from ten roads amounting to 30,000 tons.

Local mills rolling the heavier products continue to operate at 100 per cent of ingot capacity. The Gary mill has repeatedly broken its weekly production record of late, although the output for February, a short month, did not equal the monthly record of the plant.

Current local prices on bars, shapes and plates have been established by numerous sales, as indicated. In the lighter products, such as sheets and wire products the situation remains quiet and weak. Buyers appear to be unconvinced that the new prices will hold and are encouraged in their belief by scattered small sales by some of the smaller mills at the old quotations.

Pig Iron.—The market appears to have resolved itself into an endurance contest between producers and buyers. Melters are not inclined to make further purchases until they have exhausted their supplies of material bought at lower prices and in some cases the metal on hand and on order will carry them deep into second quarter. Furnaces, likewise, are committed well into second quarter, so that it is futile to venture a forecast as to the probable outcome of the deadlock. It develops that the 3000 tons of resale put on the market last week is of malleable analysis with less than the standard phosphorus content. It is really an off iron and hence sales of the material at 50c. concession have no general market significance. Current sales have been few, probably the largest being 300 tons of malleable sold to a Milwaukee melter. A local buyer is inquiring for 150 tons of 14 to 16 per cent electric ferrosilicon for Ohio delivery. Two carlot inquiries for silvery are current. No sales of Southern foundry are reported, so that there is no new information as to prices on the material.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25		$24.00
Northern No. 1 foundry, sil. 2.25 to 2.75		25.00
Malleable, not over 2.25 sil.		24.00
Basic		24.00
High phosphorus		24.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago		29.04
Southern No. 2 (barge and rail)		25.68
Southern No. 2, sil. 1.75 to 2.25	$26.51 to	27.01
Low phos., sil. 1 to 2 per cent, copper free	33.29 to	33.79
Silvery, sil. 8 per cent		35.29
Electric ferrosilicon, 14 to 16 per cent	45.00 to	47.42

Ferroalloys.—A carlot of resale spiegeleisen has been bought at less than the ruling furnace quotation. A Milwaukee user is in the market for a carload of ferromanganese.

We quote 80 per cent ferromanganese, $122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, $85, delivered; spiegeleisen, 18 to 22 per cent, $41.58, delivered.

Plates.—Railroad car buying is light, but there are persistent rumors that the Southern Pacific, the New York Central, the Santa Fe and the Chicago & Northwestern contemplate entering the market with large rolling stock programs. Interest in oil storage tanks is also at a low ebb, although there is very active drilling with the view of developing new fields to compensate for the reduced production at existing operations. There remains a fair demand for small tanks for refining plants. On the whole, plate demand is low and while mills are still receiving generous specifications, they are now able to offer early deliveries on new business. Prices are steady at 2.30c., Chicago.

The mill quotation is 2.30c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Bars.—In view of their heavy forward commitments in soft steel bars, local mills are concentrating their attention on deliveries to the end that a minimum amount of business will be lost to outside production centers. While in a few instances orders have been placed on the score of deliveries at Pittsburgh base prices, it is also reported that mills east of here have met the local prices to obtain Western tonnage. Notwithstanding the well sold condition of Chicago producers, concrete bar distributors appear to be the only buyers who have contracted for their second quarter requirements. Obviously much of the steel bought by other interests and intended for first quarter delivery will actually lap over into second quarter. Liberal inquiries from the railroads give promise of better bookings in bar iron, which remains firm at 2.10c., Chicago. An improvement in orders from the implement industry and sustained business from other sources insure steady operations for rail steel bar mills. A Chicago Heights mill has sufficient business to keep it running at double turn through March and April.

Mill prices are: Mild steel bars, 2.20c.; common bar iron, 2.10c., Chicago; rail steel, 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.70c.

Rails and Track Supplies.—The St. Louis Southwestern has placed 4000 tons of rails together with the necessary angle bars with the Gary mill. The same producer has taken orders for 2800 tons of rails for the St. Louis, Troy & Eastern, 2500 tons of tie plates for the Pennsylvania, 2500 tons of tie plates for the Santa Fe, 2000 tons of angle bars for the Chicago & Northwestern, and a substantial tonnage of angle bars for the Wabash. Specifications against rail contracts are heavy, releases from ten roads amounting to 30,000 tons. Specifications against fastening contracts are also liberal. The Nickel Plate has placed an order

with the Railroad Supply Co. for 2500 tons of tie plates, which will be rolled by the Inland Steel Co.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 1.90c. to 2c., f.o.b. makers' mill.

Standard railroad spikes, 3c. mill; track bolts with square nuts, 4c. mill; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.45c. base.

Sheets.—Buyers still hesitate to contract for their second quarter requirements at the advanced prices, and this is particularly true in territories intermediate between Chicago and other producing centers where business is still being taken by certain mills at the old quotations.

Chicago delivered prices from mill are 3.75c. to 3.85c. for No. 28 black, 2.85c. to 2.95c. for No. 10 blue annealed, 4.90c. to 5c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Bolts, Nuts and Rivets.—The new quotations have had the effect of stimulating specifications against first quarter contracts and it is probable that releases will be heavy until the end of the month. Most buyers, however, have not yet taken the new prices seriously enough to contract for their second quarter needs. Meanwhile activities in important consuming industries are on the ascending scale. There has been a slow, but steady, gain in the operations of automobile manufacturers, while recent improvement in the farm implement industry is beyond expectations. Domestic demand for farm tools appears to have set in in earnest and, in addition, large export orders have been booked. One company alone booked two orders from the Argentine totaling 92 car loads. Immediate shipment was asked, but deliveries cannot be completed until some time in April. For mill prices see page 803.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to ⅞ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to ⅞ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squares, tapped or blank, $3.50 off; hot pressed nuts, hexagons, tapped or blank, $4 off; coach or lag screws, 60 per cent off.

Cast Iron Pipe.—A tentative distribution of cast iron pipe on which Detroit took bids March 6 gives 500 tons of 12-in. and 600 tons of 16-in. to the National Cast Iron Pipe Co., 570 tons of 16-in. and 2500 tons of 24-in. to the Lynchburg Foundry Co., 1000 tons of 24-in. to James B. Clow & Sons and the remaining tonnage, embracing 960 tons of 24-in. and 6340 tons of 30-in., to the United States Cast Iron Pipe & Foundry Co. Low bids figured slightly under $40 base, Birmingham, except on the very large sizes, in which as low as $38 base, Birmingham, was named. French pipe, which actually figured 20c. lower than the lowest domestic bid on the 12-in., failed to gain serious consideration. Highland, Ill., has awarded 300 tons to the United States Cast Iron Pipe & Foundry Co., and Council Bluffs, Iowa, has placed 275 tons with the National Cast Iron Pipe Co. Pending business includes:

Milwaukee, 1000 tons of 6-in., 1000 tons of 8-in. and 500 tons of 12-in. Class C, bids to be in March 17.

Mahoning County, Ohio, County Seat, Youngstown, 1400 tons of 6-, 8-, 10- and 12-in., March 10.

Phillips, Wis., 400 tons 6- and 8-in., March 10.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $51.20 to $52.20; 6-in. and over, $47.20 to $48.20; Class A and gas pipe, $4 extra.

Wire Products.—Specifications are lagging and new business is coming in slowly. Buyers apparently are not yet convinced that the new prices will hold; in fact, scattered sales of both wire nails and cement coated nails at the old quotations have been reported. Mill operations, however, are still at a good rate. For mill prices see page 802.

Structural Material.—The week has seen a decline in both fabricating awards and inquiries. The Inland Steel Co., however, has placed additional contracts, including 1500 tons for a high line and 700 tons for a power house. The only part of its Indiana Harbor program still unplaced is a large addition to its coke ovens. Among pending projects the largest is the Stevens Hotel, Chicago, 17,000 tons, on which bids will be received until March 13. Local mills are more heavily booked in structural shapes than in plates, but can offer much better deliveries in plain material than in bars. The local market is firm at 2.30c., Chicago.

The mill quotation on plain material is 2.30c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Reinforcing Bars.—Lettings for the week were large and fresh work continues to come out at an encouraging rate. Owing to the sold-up condition of the mills, there is little incentive for concrete bar dealers to grant price concessions. There is, of course, rarely a time when some price shading is not indulged in, however slight it may be. The ruling quotation on deformed steel bars, rolled from billets, continues at 2.70c., Chicago warehouse. Lettings include:

Hupp Motor Car Co., plant addition, Detroit, 2500 tons to Kalman Steel Co.

Vadnias conduit, water department, St. Paul, 1600 tons to Concrete Engineering Co.

Missouri highway work, 200 tons to Concrete Steel Co.

Two reservoirs, Desplaines, Ill., 200 tons to Barton Spider-web System Co.

Augustana Hospital, Chicago, 150 tons to Barton Spider-web System Co.

Kresge Co. building, Sixty-third and Halsted Streets, Chicago, 100 tons to Olney J. Dean & Co.

Pending work includes:

Three public schools, Chicago, 125 tons each; low bidders on general contracts, Hanson Brothers, Midland Engineering Co. and Ericson & Christansen.

Medical building, University of Iowa, Iowa City, 500 tons.

Morgan Park High School addition, Morgan Park, Ill., 200 tons.

American National Bank building, Wausau, Wis., 100 tons, Childs & Smith, Chicago, architects.

Old Material.—The leading independent has placed 10,000 tons of heavy melting at $17.50 delivered, and the foremost mill is understood to have bought at the same price. Outside of these orders there have been very few purchases by consuming interests and prices have again declined on most grades of scrap. Sentimentally the market is weaker than for several weeks, although a reported improvement in the Youngstown market, if true, should divert the flow of scrap from intermediate territory back toward the East. Railroad offerings include the Rock Island, 7500 tons; the Great Northern, 3000 tons; the Wabash, 2500 tons, and the Chicago & Alton, 1600 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$19.00 to	$19.50
Cast iron car wheels	17.50 to	18.00
Relaying rails, 56 and 60 lb.	25.00 to	26.00
Relaying rails, 65 lb. and heavier	26.00 to	31.00
Forged steel car wheels	19.50 to	20.00
Railroad tires, charging box size	20.00 to	21.00
Railroad leaf springs, cut apart	19.50 to	20.00
Rails for rolling	18.25 to	18.75
Steel rails, less than 3 ft.	19.50 to	20.00
Heavy melting steel	17.00 to	17.50
Frogs, switches and guards cut apart	17.50 to	18.00
Shoveling steel	16.75 to	17.25
Drop forge flashings	12.50 to	13.00
Hydraulic compressed sheets	14.00 to	14.50
Axle turnings	14.75 to	15.25
Steel angle bars	18.50 to	19.00
Steel knuckles and couplers	19.00 to	19.50
Coil springs	20.50 to	21.00
Low phos. punchings	18.50 to	19.00
Machine shop turnings	11.00 to	11.50
Cast borings	14.25 to	14.75
Short shoveling turnings	14.25 to	14.75
Railroad malleable	19.50 to	20.00
Agricultural malleable	18.00 to	18.50
	Per Net Ton	
Iron angle and splice bars	19.00 to	19.50
Iron arch bars and transoms	20.00 to	20.50
Iron car axles	26.50 to	27.00
Steel car axles	18.00 to	18.50
No. 1 busheling	14.00 to	14.50
No. 2 busheling	10.50 to	11.00
Pipes and flues	11.50 to	12.00
No. 1 railroad wrought	15.00 to	15.50
No. 2 railroad wrought	15.25 to	15.75
No. 1 machinery cast	18.50 to	19.00
No. 1 railroad cast	17.00 to	17.50
No. 1 agricultural cast	17.00 to	17.50
Locomotive tires, smooth	17.00 to	17.50
Stove plate	14.50 to	15.00
Grate bars	14.00 to	14.50
Brake shoes	14.00 to	14.50

New York

Pig Iron Market Weaker—Limited Business in Finished Material

NEW YORK, March 10.—The pig iron market is weaker in eastern Pennsylvania, having receded 50c. to a basis of $23, furnace, for No. 2 plain. In the Buffalo district, the market is unsteady at $22. The principal purchase of the week was made by the Central Foundry Co., 8000 tons. The Essex Foundry Co. purchased about 3000 tons and sales of Virginia iron amounted to about 1500 tons. There were also scattering sales. One firm sold 2100 tons, of which one-third was for spot delivery. Pending inquiry is light, the principal tonnages being from New Jersey melters, one for 1000 tons for delivery in four to six weeks and one for 750 tons for second quarter. Despite the newly developed weakness following a period of about a month of dullness, the market is not demoralized and it does not seem probable that there will be much further recession.

We quote delivered in the New York district as follows, having added to furnace price $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	$25.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	26.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	26.52
Buffalo, sil. 1.75 to 2.25	26.91
No. 2 Virginia, sil. 1.75 to 2.25	$29.44 to 30.44

Ferroalloys.—New business in ferromanganese continues exceedingly light, being confined to small and carload lots for early delivery. Quotations are unchanged and firm. There have been a few sales of carload and small lots of spiegeleisen at the regular quotations which are firm. Specifications on contract for both alloys are fairly insistent. There is very little new business in 50 per cent ferrosilicon or standard ferrochromium, prices for which are unchanged.

Cast Iron Pipe.—Determination of the actual market is exceedingly difficult in view of the weakness in prices that has set in, caused by action of domestic makers in quoting prices low enough to compete with the imported product. The City of New London, Conn., recently awarded 1000 tons of 8-, 10-, 12- and 16-in. water pipe to the Warren Foundry & Pipe Co. The agents for European pipe are understood to have bid $52 per ton on this contract, about $3 a ton higher than some previous bids that took business. Soil pipe business is practically at a standstill. While prices are nominally unchanged, occasional offers of an added 2½ per cent discount from list show a rapidly developing weakness.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $52.60 to $53.60; 4-in. and 5-in., $57.60 to $58.60; 3-in., $67.60 to $68.60, with $5 additional for Class A and gas pipe. Discounts on both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40 to 41¼ per cent off list; heavy, 50 to 51¼ per cent off list.

Warehouse Business.—There was a fair movement of bars, but otherwise nothing developed during the week to divert the market from its quiet way. It is whispered that a supply of structural steel, perhaps several months' supply, waits movement. Prices are steady. Some jobbers looking into second quarter coverage meet a disposition on the part of the mills to ask for the higher prices, which in some lines are tottering. If this persists, jobbers will buy in the open market. The solder group dropped back 2c., as did also tin. Prices are given on page 818.

Finished Iron and Steel.—In new buying the past week has been exceptionally dull. It now looks that the carry over on first quarter contracts will be sufficiently large in connection with the high rate of shipments still proceeding to postpone any fresh spurt of buying or the real test of prices until sometime in April. There is no noticeable reduction in the volume of production though expectations are that there will be some curtailment on the score that the present rate of steel making is so exceptionally high that it is calculated to result in over-production and reduced prices. Buyers feel surer now than they did a few weeks ago that they will not pay the last announced prices, taking their cue from the fact that buying in sheets has been successful at concessions even from the prices obtained prior to the last sheet advance. In view of the large amounts of steel that have been leaving the mills since the first of the year, it is generally believed that many first quarter contracts must have been written for amounts considerably beyond the needs of the quarter, a fact which accounts for the present lull in fresh commitments. The trade expects to see an adjustment between the volume of consumption and production, holding that conditions have not changed to affect adversely the rate of current consumption but maintaining that the mills cannot continue manufacturing at the present high rate, however attractive this may be from a cost of making standpoint. Prices are unchanged except that those quoted recently as maxima do not now seem to figure in any transactions and have been eliminated.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c. to 2.54c.; plates, 2.34c. to 2.44c.; structural shapes, 2.44c. to 2.54c.

Coke.—Operators are still perplexed over union labor's obstinacy directly in the face of price weakening resulting from weakness in pig iron. Yet the reckoning with labor is not far away. With considerable unemployment among union hands, it is regarded by operators as the opportune time to move for a reversion to 1917 wages. The Jones & Laughlin Steel Corporation placed 12,000 tons monthly for second quarter with three companies at a price said to be $4.25, but supposed to carry a wage clause which brings it to a much lower figure. Other buyers will go as far as $3.50 for that period, reckoning on lower wage rates and placing the risk of higher wage demands on the operators. This is too precarious to attract seller interest.

Old Material.—The downward trend of prices on all grades is still the principal feature of the market. With prices apparently nearing bottom, evidenced by the increasing difficulty encountered in securing scrap at the lowest prices offered, brokers are hastening to conclude shipments on old contracts. The depressed condition of the old material market is regarded in many quarters as a reflection of the weak and inactive situation in pig iron. Heavy melting steel is being purchased at $15 to $16 a ton, delivered eastern Pennsylvania, the former price more general than the latter. Forge fire is being purchased at $14.50 per ton, delivered. Borings and turnings have registered a further decline and are now being purchased by brokers at $12.50 per ton, delivered eastern Pennsylvania. Stove plate shows a slight advance in the buying price caused by the return to purchasing of a West Mahwah, N. J., consumer with a freight rate of $2.02 a ton, for which $13.50 delivered is being paid. Shipments of stove plate to an eastern Pennsylvania consumer with $3.50 freight rate, for which $14 a ton delivered is being offered, justify a range in the buying price New York of $10.50 to $11.50 a ton.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$12.00 to $12.50
Heavy melting steel, railroad or equivalent	12.50 to 13.00
Rails for rolling	15.00 to 15.50
Relaying rails, nominal	24.00 to 25.00
Steel car axles	19.50 to 20.00
Iron car axles	24.00 to 24.50
No. 1 railroad wrought	15.00 to 15.50
Forge fire	10.50 to 11.00
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (steel mill)	10.50 to 11.00
Cast borings (chemical)	16.00 to 16.50
Machine shop turnings	10.00 to 10.50
Mixed borings and turnings	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate	10.50 to 11.50
Locomotive grate bars	12.00 to 12.50
Malleable cast (railroad)	15.00 to 15.50
Cast iron car wheels	14.75 to 15.25
No. 1 heavy breakable cast	12.50 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$16.00 to $16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

Birmingham

Pig Iron Prices Maintained in a Dull Market —Scrap Declines

BIRMINGHAM, ALA., March 10.—With no change in market conditions, slow sales and small lots and maintenance of the upper quotation, $22 per ton for No. 2 foundry, furnace interests still assert in this district that the pig iron market is strong. The second quarter of the year is approaching and sales made in November, December and part of January will provide deliveries into the second quarter of the year. The small lot business since Jan. 15 and through February has added some to the unfilled tonnage figures, and furnace operators believe there will be warrant for heavy production, the surplus stock on foundry iron having been materially reduced in the past few months.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows, the lower prices being for first quarter and the higher those of the largest producers for second quarter:

No. 2 foundry, 1.75 to 2.25 sil.	$21.50 to $22.00
No. 1 foundry, 2.25 to 2.75 sil.	22.00 to 22.50
Basic	21.00 to 22.00
Charcoal, warm blast	30.00

Steel.—The steel mill operations are operating at the same pace as has been noted now for the past two weeks, the Steel Corporation subsidiaries going at around capacity and the independent company, Gulf States Steel Co., operating four out of six open-hearth furnaces. The steel fabricating plants of the district are doing well, even the smaller plants having contracts which call for steady work. No change in prices was noted the past week. Steel bars in Birmingham are quoted 2.25c. to 2.35c. The Connors Steel Co. in rolling cotton ties is indicating a larger demand for the product.

Cast Iron Pipe.—Unfilled tonnage with the cast iron pressure pipe is still gathering strength and further specifications are in sight. The first of the spring buying more than came up to expectations. The McWane Cast Iron Pipe Co. will be able to put its addition in operation within the next eight weeks, 200 men to be added to the force at the plant.

Coke.—The 25 additional coke ovens at the by-product plant of the Alabama By-Product Corporation will start up this week, adding considerably to the output of the independent company. This company now has 100 ovens altogether and its output is being marketed steadily. The coke market continues good, with the quotations based at $5 for foundry coke. The beehive coke is selling at $5.50 per ton. The 57 by-product ovens being built for the Republic Iron & Steel Co. here will hardly be completed until fall.

Old Material.—The scrap market in Alabama is weakening and quotations for the product are also off, the steel products going down $1 per ton. Dealers are maintaining their yard forces and are expressing hope that the decline will be temporary. The change in this market as compared to 60 days ago is noticeable. Much old material is still due on old contracts but new business is rather scarce.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	14.00 to 15.00
Railroad wrought	13.00 to 14.00
Steel axles	18.00 to 19.00
Iron axles	19.00 to 20.00
Steel rails	14.00 to 15.00
No. 1 cast	17.00 to 17.50
Tramcar wheels	17.00 to 17.50
Car wheels	16.00 to 17.00
Stove plate	14.50 to 15.50
Machine shop turnings	8.00 to 9.00
Cast iron borings	8.00 to 9.00
Rails for rolling	16.50 to 17.00

The new steel warehouse of Beals, McCarthy & Rogers, now building at Elk and Catherine Streets, Buffalo, will be finished by the spring, it is expected. It is two stories and is exclusively a storage and distributing plant. It will be equipped with cranes and double tracked railroad sidings. The general offices of the company will remain at Nos. 40 to 62, The Terrace.

Boston

Pig Iron Market Still in the Doldrums— Prices Appear Firmer

BOSTON, March 10.—Pig iron is in the doldrums. Current sales are confined to scattering car lots; there are no inquiries of moment; the New England melt is larger than it was a month back, but only slightly so; most foundries have enough iron on hand and on order to carry well into the second quarter and some through that period, on the present ratio of melt. Because of the market's inactivity, prices for domestic iron appear firmer. Indian iron is growing scarce and is now generally $24.50 on Boston dock duty paid for silicon 2.50 to 3.00. Dutch iron is available at $1 to $1.50 less, depending on the point of delivery. Continental iron is about 50c. a ton cheaper than Dutch. It is believed March will wind up Continental iron importations, and competition with domestic furnaces practically confined to Dutch. Local imports of foreign iron in February totaled 13,701 tons, consisting of 7605 tons Dutch, 3963 tons Indian and 2133 tons of Belgian. Imports for January and February combined were 9605 tons Dutch, 9425 tons Indian, 2133 tons Belgian and 750 tons English, a total of 21,913 tons. During the first week in March, an additional 1000 tons from India was landed here, bringing the total imports for 1925 up to 22,913 tons.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$26.65 to $27.15
East. Penn., sil. 2.25 to 2.75	27.15 to 27.65
Buffalo, sil. 1.75 to 2.25	26.91 to 27.41
Buffalo, sil. 2.25 to 2.75	27.41 to 27.91
Virginia, sil. 1.75 to 2.25	29.92
Virginia, sil. 2.25 to 2.75	30.42
Alabama, sil. 1.75 to 2.25	31.60
Alabama, sil. 2.25 to 2.75	32.10

Coke.—By-product foundry coke market conditions are little changed. Both the New England Coal & Coke Co. and the Providence Gas Co. continue to quote $12 delivered in New England on March specifications against first half contracts. Shipments by ovens show little, if any increase; consequently consumption is still below normal. Deliveries are made on scheduled dates. The demand for domestic fuel is less urgent due to a moderation in weather conditions. Foundry interest in Connellsville district coke is practically nil.

Old Material.—Offerings of old material are small, but there is little incentive to buy, consequently the market is still inclined toward weakness. A drop of $1 in bids on chemical borings and mixed borings and turnings; 50c. on heavy melting steel and a sympathetic decline on scrap rails; and 25c. on machine shop turnings represent practically the only real change in prices, however, Sentiment among brokers is cheerful, the dullness in business notwithstanding. It is felt mills will start buying before the end of March.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.50 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plates	14.00 to 14.50
Railroad malleable	19.00 to 20.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.00 to $12.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 yard wrought	13.00 to 13.50
Wrought pipe (1-in. in diam., over 2 ft. long)	11.50 to 12.00
Machine shop turnings	8.75 to 9.00
Cast iron borings, chemical	13.50 to 14.00
Cast iron borings, rolling mill	9.00 to 9.50
Blast furnace borings and turnings	7.50 to 8.00
Forge scrap	10.50 to 10.75
Bundled skeleton	10.50 to 10.75
Bundled cotton ties	8.50 to 9.00
Forged flashings	10.00 to 10.50
Shafting	18.50 to 19.00
Street car axles	18.50 to 19.00
Rails for rerolling	14.50 to 15.00
Scrap rails	12.00 to 12.50

Cast Iron Pipe.—New London, Conn., has awarded 1200 tons of 16-in. pipe and 200 tons 8-in., 10-in. and 12-in. to the Warren Foundry & Pipe Co. and Augusta,

Me., 250 tons 8-in. to the same company. The United States Cast Iron Pipe & Foundry Co. has sold 500 tons of 6-in., 8-in., 10-in. and 12-in. pipe to Springfield, Mass. The B. Nicoll Co., offering French pipe, was the low bidder on 165 tons of 6-in. to 12-in. pipe required by Beverly, Mass. Labor unions voiced considerable opposition to the city buying foreign pipe on the ground it is discriminating against domestic industries. During the past week 1415 pieces of foreign pipe were received at this port. It is reported one of the large Massachusetts gas companies has placed an additional order for 2000 tons of 6-in. and 8-in. gas pipe. Prices on cast iron pipe follow: 4-in., $62.10 a ton delivered common Boston rate points; 6-in. to 12-in., $57.10; 16-in. and larger, $56.10. The usual differentials of $5 on Class A and gas pipe are maintained.

St. Louis

Scattering Sales of Small Lots of Pig Iron with One Sale of 1000 Tons in a Dull Week

ST. LOUIS, March 10.—The only pig iron sale of consequence during the week was 1000 tons of Southern iron to a St. Louis jobbing foundry for water and rail shipment on the basis of $22, f.o.b. Florence, for May and June delivery. A few scattering carload orders complete a very dull week. Foundries are well covered on their present requirements, and show virtually no interest in second quarter shipments.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$26.16
Northern malleable, sil. 1.75 to 2.25	26.16
Basic	26.16
Southern fdy., sil. 1.75 to 2.25 (rail)	$26.17 to 27.17
Southern fdy., sil. 1.75 to 2.25 (rail and water)	24.28 to 25.28
Granite City iron, sil. 1.75 to 2.25	25.81 to 26.31

Old Material.—The American Steel Foundries bought 5000 tons of specialties, including couples, knuckles and springs, No. 1 cast steel and bits and jars. The order was spread out among most of the St. Louis dealers who already had in stock or had contracted for quantities sold, so that there is very little short interest. New railroad lists include the following: Baltimore & Ohio, 16,000 tons, including 2200 tons of dismantled steel cars; Chicago & Alton, 2000 tons; Wabash, 2500 tons; Nickel Plate, 420 tons; Kansas City Southern, 400 tons; Missouri Pacific, 5000 tons; Mobile & Ohio, 1200 tons, and Missouri, Kansas & Texas, 2200 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Iron rails	$17.50 to $18.00
Rails for rolling	18.50 to 19.00
Steel rails less than 3 ft.	20.00 to 20.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	18.50 to 19.00
Heavy melting steel	17.00 to 17.50
Heavy shoveling steel	17.00 to 17.50
Frogs, switches and guards cut apart	17.50 to 18.00
Railroad springs	20.00 to 20.50
Heavy axles and tire turnings	13.00 to 13.50
No. 1 locomotive tires	19.00 to 19.50

Per Net Ton

Steel angle bars	16.00 to 16.50
Steel car axles	19.50 to 20.00
Iron car axles	25.50 to 26.00
Wrought iron bars and transoms	20.50 to 21.00
No. 1 railroad wrought	15.25 to 15.75
No. 2 railroad wrought	15.25 to 15.75
Cast iron borings	12.50 to 13.00
No. 1 busheling	15.00 to 15.50
No. 1 railroad cast	18.00 to 18.50
No. 1 machinery cast	19.00 to 19.50
Railroad malleable	16.00 to 16.50
Machine shop turnings	8.50 to 9.00
Champion bundled sheets	9.50 to 10.00

Coke.—A fairly good business is being done in industrial grades by by-product ovens in this district, but very little is coming from the Connellsville district. Warmer weather has put a crimp into the domestic coke business.

Finished Iron and Steel.—Buying is very light, consisting entirely of fill-in business. Warehouses and manufacturers of steel products are practising extreme caution in their purchases.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.80c.; galvanized steel sheets, No. 28, 5.80c.; black corrugated sheets, 4.95c.; galvanized, 5.95c.; cold rolled rounds, shafting and screws stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{7}{8}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, $3.50; hexagons, blank or tapped, $4 off list.

More Stability in Old Material Market at Detroit

DETROIT, March 10.—No further declines have been registered in this district during the past week on old material and while sales have been light, there is a tone of stability which needs further sales to substantiate.

Automobile manufacturers are showing slightly increased schedules in the foundry end for the month of March and the general melt promises to be heavier toward the end of the month.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	$14.75 to $15.75
Borings and short turnings	11.75 to 12.50
Long turnings	11.75 to 12.25
No. 1 machinery cast	18.00 to 19.00
Automobile cast	21.00 to 22.00
Hydraulic compressed	13.25 to 13.75
Stove plate	16.00 to 17.00
No. 1 busheling	13.25 to 13.75
Sheet clippings	10.75 to 11.25
Flashings	12.50 to 13.00

United States Supreme Court Decision on Suit to Recover Taxes

WASHINGTON, March 10.—"The injustice thought to be worked upon domestic corporations engaged in sales abroad by a different classification for purposes of taxation of foreign corporations similarly engaged is an argument, not for the constitutional invalidity of the law before a court, but for its repeal before Congress."

The foregoing epitomizes a decision announced yesterday by the United States Supreme Court through Chief Justice Taft. It was a reaffirmation of a decision rendered last December through Mr. Justice McKenna when the court passed upon the cases of the National Paper & Type Co. and Barclay & Co. The latter asked for a rehearing and the decision of yesterday, denying the rehearing, was the result.

The suit was to recover taxes which, it was claimed, were illegally collected, under both the revenue acts of 1918 and 1921. It was charged by the corporation that it was subjected to taxes on all of its net income, including profits made in the sale of goods abroad, while foreign corporations engaged in the same business of buying and selling manufactured goods in this country and selling abroad were not taxed upon their whole net income but were exempted from a tax on all or a part of it. Objection also was held that the assessment was a tax on exports, but the court had previously denied this plea.

This year's Swiss Industries Fair, an institution said to date back to the fifteenth century, will be held April 18 to 28 at Basel, Switzerland. Particulars may be obtained from the Consulate of Switzerland, 104 Fifth Avenue, New York.

Cincinnati

Pig Iron Prices Weak—Coke Market Is Stronger

CINCINNATI, O., March 10.—Weakness in prices and scarcity of sales feature the local pig iron market. Consumers are buying only for immediate needs and are not inclined to place business for second quarter delivery in sizable quantities. Several southern Ohio furnaces are reported to be piling iron due to the quiet conditions that prevail.

The furnace of the Belfont Iron Works Co., Ironton, Ohio, has been banked for several weeks while repairs are being made, but it is expected that this furnace will go into blast again within 10 to 15 days. The largest sale reported the past week was that of 500 tons of Northern foundry iron for March and April delivery to a Springfield, Ohio, manufacturer. No other sales totaling more than several carloads have been made. The Standard Sanitary Mfg. Co., Pittsburgh, has an inquiry out for 3000 tons of Northern iron and 5000 to 10,000 tons of Southern for second quarter for its Louisville, Ky., plant. Prices at Ironton have weakened. One furnace is selling at $21.75, furnace, for first quarter business. Another company is asking $23, but is not selling any iron at this price and is accepting business at $22.50. There has been little activity in Southern iron. Sales have been restricted to small tonnages and few inquiries have been reported, none of which is for large quantities. Prices continue to range from $20 to $22, Birmingham, although there have not been sufficient sales to test the market. Tennessee Iron is obtainable at $20 Birmingham for March delivery. Small sales of Alabama iron are reported at $21.50. Several Alabama furnaces are maintaining $22 as their selling price, but it is believed that this quotation would be shaded if any good business developed.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	$24.05 to $25.05
Southern fdy., sil. 2.25 to 2.75	24.55 to 25.55
Southern Ohio silvery, 8 per cent	32.77
Southern Ohio fdy., sil. 1.75 to 2.25	24.02 to 25.27
Southern Ohio, basic (nominal)	24.27
Southern Ohio malleable	24.27 to 25.27

Structural Steel.—The demand in Cincinnati territory was quiet during the past week and no awards of importance were made. Inquiries have also fallen off. The Hocking Valley Railroad Co. is asking for bids on a bridge job which requires approximately 500 tons. Prices are steady at 2.20c., Pittsburgh, for second quarter business, with 2.10c. for immediate delivery.

Sheets.—Increased sales activity featured the sheet market during the last week. Sales were better than they have been for several weeks, and there has been a larger number of inquiries. A review of the local market shows that the volume of business done during the first two months of 1925 was about the same as during the corresponding period last year. There have been several good orders placed for immediate delivery, but buyers, considered as a whole, are amply stocked for their first quarter's needs. Shipments on contracts are going ahead at a satisfactory rate. Jobbers report that their business has been only fair. The price on black sheets is firm at 3.60c., Pittsburgh. Galvanized sheets have been steady at 4.85c., Pittsburgh, while other quotations are 2.70c. on blue annealed and 4.60c. on auto sheets.

Tin Plate.—No change has been noted in the local market. The volume of sales is satisfactory for this time of the year, and is gradually showing an increase as the canning season draws nearer. The price of $5.50 per base box, Pittsburgh, still holds. Contract shipments are being made without interruption.

Reinforcing Bars.—No large awards have been made. There is, however, considerable business pending, and it is thought that some of it will be contracted for during the next ten days. Pending projects are 300 tons for the Children's Hospital, Cincinnati; 100 tons for the Cheviot School, Cheviot, Ohio, and 350 tons for a bridge at Roanoke, Va. Prices on reinforcing bars are fairly firm at 2.10c., mill, although shading of this quotation is still noticeable.

Warehouse Business.—Business has been rather quiet during the past ten days, although dealers are unanimous in their belief that the volume of sales this month will run considerably ahead of the sales in February. Buyers continue to be conservative and are prone to order only when necessity demands replenishment of stock for immediate needs. They are asking dealers for prompt delivery. Prices have remained unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3.25 per 100 lb.; common wire nails, $3.25 per keg base; cement coated nails, $2.65 per keg; chain, $7.55 per 100 lb. base; large round head rivets, $3.75 base; small rivets, 65 per cent off list.

Finished Materials.—A slight improvement has been reported by the majority of companies. Sales have increased on bars, shapes and plates. The price of 2.20c., Pittsburgh, is gradually gaining strength, although buyers are being taken care of on their first quarter's requirements at 2.10c., Pittsburgh. There has been an increase in the amount of second quarter business being placed, but this has not reached large proportions to date. Fair sales have been in wire products. Quotations of 2.70c., Pittsburgh, for plain wire and 2.95c., Pittsburgh, for nails are becoming more firmly established. Jobbers continue to report that their business is only fair. There has been an increase in the inquiries for track fastenings. Prices on small spikes aré 3.20c., Pittsburgh, and on large spikes 2.90c., Pittsburgh. No improvement has been noted in light rails, which are quiet at present.

Connellsville furnace, $3.50 to $4.00; foundry, $4.25 to $5.50; New River foundry, $8.00 to $8.50; Wise County furnace, $4.00 to $5.00; foundry, $4.50 to $6.00; by-product foundry, $6.50 Connellsville basis.

Coke.—The coke market is stronger than a week ago, although conditions are still quiet. Domestic business has been good and sales of foundry coke have been fair. By-product coke is in good demand. Contract shipments are moving satisfactorily. Prices are showing more strength.

Old Material.—The scrap market is colorless. Few sales are reported by dealers, although consumers are showing more inclination to buy, provided that they can make purchases at a favorable price. The Louisville & Nashville, Southern and New York Central have lists out, but their monthly offerings are below the normal tonnage. Prices remain firm and unchanged.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$14.50 to $15.00
Scrap rails for melting	14.50 to 15.00
Short rails	18.50 to 19.00
Relaying rails	29.50 to 30.00
Rails for rolling	16.00 to 16.50
Old car wheels	14.00 to 14.50
No. 1 locomotive tires	17.50 to 18.00
Railroad malleable	16.50 to 17.00
Agricultural malleable	15.00 to 15.50
Loose sheet clippings	11.50 to 12.00
Champion bundled sheets	12.50 to 13.00
Per Net Ton	
Cast iron borings	11.00 to 11.50
Machine shop turnings	10.00 to 10.50
No. 1 machinery cast	18.50 to 19.00
No. 1 railroad cast	15.50 to 16.00
Iron axles	22.50 to 23.00
No. 1 railroad wrought	12.00 to 12.50
Pipes and flues	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
Mixed busheling	9.50 to 10.00
Burnt cast	11.00 to 11.50
Stove plate	11.50 to 12.00
Brake shoes	12.00 to 12.50

The Houde Engineering Co., Buffalo, has acquired the entire stock and business of the Houdaille company, the sales organization which has been handling the Houdaille shock absorber in the United States. This means that the Buffalo company has now complete control in this country of the manufacture and sale of the French shock absorber.

Cleveland

Some Pig Iron Prices Marked Down—More Automobile Business

CLEVELAND, March 10.—New business in finished steel is rather light and orders are confined mostly to small lots. With the approach of spring, considerable construction work is developing that will require large tonnages of reinforcing bars. This includes track elevation and various public and semi-public work. With increased production automobile companies are taking steel more freely, but few, if any, are making commitments beyond April.

Specifications continue good.

Buyers show no disposition to allow any tonnage on first quarter contracts to be cancelled, this business having been taken at lower than prevailing prices. In the case of steel bars, the bulk of the first quarter business was booked at 2c. The price of steel bars, plates and structural material is becoming more generally established at 2.10c. While small lot steel bar tonnage is being taken at 2.20c., some of the mills will go to 2.10c. for even a car lot, and it seems improbable that the market will be established at 2.20c. for the second quarter. However, steel bars, plates and structural material are firm on the 2.10c. basis. Screw stock regularly quoted at 2.85c. lacks firmness. Hoops and bands are firm at 2.50c. and there is no report of shading the new extras. Structural inquiry has improved somewhat, but competition is unusually keen and fabricators are naming very close prices.

The outstanding award is 6000 tons for the new mill buildings for the McKinney Steel Co. In the railroad field the New York Central Lines have revised their inquiry for 100 locomotives and the Nickel Plate Railroad during the week placed a large tonnage of tie plates, spikes and track bolts for its 1925 requirements. The City of Cleveland has placed a contract for water pipe extensions requiring 3000 tons of pipe and has decided to use partly the lock bar type of pipe and the remainder cast iron pipe.

Pig Iron.—Few consumers are showing a disposition to buy for the second quarter and not much activity is looked for with the present rather unsettled price situation. Some of the Lake furnaces have lowered their quotations 50c. to $1 on foundry grades, concessions being larger when the sellers come in competition with the Valley district, where the price range on foundry and malleable iron is $21.50 to $22. Furnaces in Cleveland are quoting these grades at $22 for outside shipment, but another producer who is not affected so much by Valley competition is holding to $22.50 to $23. For Cleveland delivery local furnaces are asking $23 to $23.50, at furnace, but the lower price more nearly represents the market and as prices are untested, a round lot inquiry might bring out a lower quotation to shut out Valley competition. Shipments continue good. There has been some gain in consumption in the automotive industry, but foundries and other fields are operating at about the rate they have been recently. One producer sold 5000 tons of iron during the week, largely in western Ohio and in Indiana, where there is more activity than in other sections. In Cleveland and vicinity the market is very dull. The McKinney Steel Co., which is operating two furnaces in Cleveland, plans to blow in this month a third furnace which has been out for relining. On the other hand, there are reports that some furnaces will be blown out or banked.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace		$21.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	$23.50 to	23.75
Southern fdy., sil. 1.75 to 2.25	26.01 to	27.01
Malleable	23.50 to	23.75
Ohio silvery, 8 per cent		33.52
Standard low phos., Valley furnace		29.00

Iron Ore.—Ore sellers are not as hopeful as they were that this season's prices will be established at substantial advance over last year. While the price situation is unsettled, one small producer is reported to have offered ore at as low as last year's prices. It is not expected that prices will be named before April.

Ore Shipments.—During February 703,185 tons of ore was shipped from Lake Erie docks, as compared with 622,581 tons in January and with 522,505 tons in February last year.

Bolts, Nuts and Rivets.—Bolt and nut makers have adopted a quantity differential following the recent abandonment of the plan of quoting prices with freight allowed on leading items. Recent discounts are unchanged for car lots, but an advance of 5 per cent is now being quoted on less than car lots, making a 50, 10 and 5 per cent off list the discount for machine bolts in less than car lots. On hot-pressed and cold-punched nuts a quantity differential of 25c. per 100 lb. is now asked for less than car lots. If these differentials hold they will mean a price advance on a large part of the products. Orders for bolts, nuts and rivets are fair. Rivet prices have not yet been announced for the second quarter, but present prices will probably be named. Small rivets are weak.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 3.85c.; No. 9 annealed wire, $3.25 per 100 lb.; No. 9 galvanized wire, $3.70 per 100 lb.; common wire nails, $3.35 base per 100 lb.

Semi-Finished Steel.—Sheet mills are still feeling the market on sheet bars for the second quarter. Cleveland and Valley mills continue to ask $39 at mill, but in view of the present price situation on sheets, some reduction is expected. Consumers are trying to get a $37.50 price.

Sheets.—The sheet market is weak on all grades, particularly for prompt shipment, as some of the mills are in need of orders. Black sheets have sold at 3.25c. for immediate specifications. Some business has been taken for the second quarter at 3.40c., and 3.50c. has become a rather common price. Galvanized sheets have sold at 4.65c. for immediate specifications and some second quarter business has been taken at 4.75c. Auto body sheets are rather commonly quoted at 4.50c. to 4.60c., although these have sold as low as 4.40c., as reported last week.

Reinforcing Bars.—Inquiry has improved. A factory building for the Goodrich Rubber Co., Akron, will require about 1500 tons and other inquiries include 500 tons for foundations for the blast furnace of the Central Furnace Co., Massillon, Ohio, and 150 tons for a warehouse for the Neal Fireproof Storage Co., Cleveland. Rail steel bars are unchanged at 1.90c. to 2c.

Alloy Steel.—Some of the mills are now taking orders for alloy steel for the second quarter at prices that prevailed during the first quarter, efforts to get higher prices, of which there has been talk, evidently having been abandoned. Automobile companies as a rule are ordering only for their April requirements.

Warehouse Business.—Local jobbers have placed in effect the new extras on hoops and bands and are now quoting these at 3.85c., base.

Coke.—Foundries continue to buy in small lots for immediate requirements. The market is weak, with quotations ranging from $4.50 to $5.50 for the better grades of Connellsville foundry coke.

Old Material.—The downward price tendency that has been in evidence for several weeks appears to have been checked. The general sentiment in the trade is that prices will go no lower and that while some buying might result in a slight stiffening, it would not bring about very much of an advance. Activity is confined mostly to small lot purchases by dealers who are covering on short sales. Several large consumers are still

holding up shipments. In some cases mills have cancelled scrap bought at higher prices and not delivered within the time specified. Prices are unchanged.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$16.50 to $16.75
Rails for rolling	17.50 to 17.75
Rails under 3 ft	19.00 to 19.50
Low phosphorus melting	19.00 to 19.50
Cast iron borings	14.00 to 14.25
Machine shop turnings	13.20 to 13.60
Mixed borings and short turnings	13.75 to 14.00
Compressed sheet steel	14.50 to 14.75
Railroad wrought	13.50 to 13.75
Railroad malleable	19.50 to 20.00
Light bundled sheet stampings	12.25 to 12.50
Steel axle turnings	14.75 to 15.00
No. 1 cast	18.75 to 19.25
No. 1 busheling	13.75 to 14.00
Drop forge flashings	12.50 to 12.75
Railroad grate bars	14.50 to 14.75
Stove plate	14.50 to 14.75
Pipes and flues	10.50 to 11.00

Buffalo

Light Demand for Pig Iron with Tendency Toward Lower Prices

BUFFALO, March 10.—Inquiry has again tapered off with a total of not more than 5000 tons registered this week. The outstanding requirements were one for 600 tons of foundry and one for 600 tons of malleable. It is believed that the Massey-Harris inquiry for 2000 tons is still before the market as reported last week. The resale iron in this market is still an unsettling factor and the price is still inclined to softness. Furnaces report running into $22 iron quotations and as a consequence have had to lower their own price to $22 on some occasions. A situation has been reached where furnaces are treating each inquiry as an individual transaction and are negotiating. Operations so far remain the same and it is reported that Wickwire-Spencer Steel Corporation is still considering lighting a furnace though final decision has not yet been made.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25	$22.00 to $23.00
No. 2X foundry, sil. 2.25 to 2.75	22.50 to 23.50
No. 1 foundry, sil. 2.75 to 3.25	23.50 to 24.50
Malleable, sil. up to 2.25	23.00
Basic	23.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Specifications are continuing to come in about as scheduled, though the market has not gained any impetus in several weeks. Mill operations remain stationary. The price of bars and shapes continues from 2.365c. to 2.465c., delivered Buffalo, and the sheet prices from 4.60c. for full pickled to 3.50c. to 3.60c. for black sheets freight allowed. Some sizable reinforcing bar inquiries are out, including four school jobs for 250 tons apiece in Buffalo and two Rochester school jobs for 250 tons apiece. A Buffalo elevator will require about 700 tons. Wire mills report good business. Noteworthy operation of four Wickwire-Spencer open hearths during the months of January and February shows production of 15,000 tons of steel per month or 30,000 tons for the period.

Warehouse prices are being quoted as follows: Steel bars, 3.30c.; steel shapes, 3.40c.; steel plates, 3.50c.; No. 10 blue annealed sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.85c.; cold rolled shapes, 4.70c.; cold rolled rounds, 4.20c.; wire nails, 4.00c.; black wire, 4.05c.

Old Material.—The market is very quiet with dealers furnishing the bulk of the business. One mill is offering $16.75 for heavy melting steel and is picking up small lots at this price of the particular grade of heavy melting this plant can use. Another company is offering $18 for strictly No. 1 heavy melting steel while dealers are offering the same price to apply against old orders. A slight demand exists for borings and turnings at $12.50 and some sales of short shoveling turnings have been made at a higher price. It is stated that mills will do little heavy buying soon, as it is felt that stock piles are sufficient to answer open-hearth needs for some time at the present rolling schedules.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	$17.00 to $18.00
Low phosphorus	19.00 to 20.00
No. 1 railroad wrought	15.00 to 15.50
Car wheels	18.50 to 19.50
Machine shop turnings	12.50 to 13.00
Cast iron borings	12.50 to 13.00
No. 1 busheling	17.50 to 18.00
Stove plate	16.00
Grate bars	13.00 to 13.50
Bundled sheets	12.50 to 13.00
Hydraulic compressed	17.50 to 18.00
Railroad malleable	19.00 to 20.00
No. 1 cast scrap	18.00 to 18.50
Iron axles	27.00 to 28.00
Steel axles	18.50 to 19.00

Demand for Iron and Steel Scrap Improves in Canada

TORONTO, ONT., March 9.—Improving demand for iron and steel scrap features the Canadian market. Dealers in both Toronto and Montreal districts say that melters are showing renewed interest in the market and that while buying is still much below normal, the general trend of the market is stronger. Foundries and mills in the Hamilton, Ont., district have been increasing production operations, with some foundries in this district running above 60 per cent capacity, while the mills are also operating about the same level, with much brighter prospects for increasing present operations. This improvement in activities in the Hamilton district has resulted in a more active demand for scrap, especially heavy melting steel and turnings, machinery cast and malleable scrap. In the Montreal market, a good demand is reported for wrought iron and steel axles, as well as a better demand for heavy melting steel and machinery cast. Dealers also report a stronger demand for scrap on export account. Trading between dealers has been more active of late, the improved consumptive demand has had the effect of depleting dealers' yard holdings, and as a result the latter have been showing a tendency to buy on a more extensive scale of late. The improved demand has not been reflected in higher prices, but it is noted that in most cases dealers are prepared to buy without waiting for bargains. Canadian dealers' buying prices are as follows:

Gross Tons

	Toronto	Montreal
Steel turnings	$11.00	$10.00
Machine shop turnings	11.00	9.00
Wrought pipe	7.00	8.00
No. 1 wrought scrap	13.00	12.00
Heavy melting steel	12.75	12.00
Steel axles	16.00	18.00
Axles, wrought iron	18.00	20.00

Net Tons

Standard car wheels	16.00	16.00
Malleable scrap	14.00	16.00
Stove plate	14.00	13.00
No. 1 machinery cast	18.00	18.00

"Farrells 85 Special Purpose Steel" is the title of an attractively illustrated pamphlet issued by the Farrell-Cheek Foundry Co., Sandusky, Ohio. It describes a special steel, the development of which was successful on the completion of the eighty-fifth experiment. It is recommended for use in cast tooth gears, sprockets, rollers, dipper and bucket teeth and pressure parts, and on other types of castings where great stress, toughness and wear-resisting material is essential.

Plans for promoting the export of automobiles are expected to be fully formulated by the time of the next World Motor Trade Congress, which the National Automobile Chamber of Commerce has decided to hold in New York, Jan. 11, 12 and 13, next year. According to *Automotive Industries* prophets in the industry estimate that by 1935 foreign countries will be taking one-fourth of the American production.

Philadelphia

Second Quarter Pig Iron Buying Weakens Prices 50c. a Ton

PHILADELPHIA, March 10.—To a large extent buyers continue to wait to see what will happen. The past week, however, brought the heavier buying of pig iron for second quarter, two makers of soil pipe contracting for upward of 10,000 tons at prices 50c. a ton under those recently prevailing. In steel bars there has been a fair volume of second quarter contracting, uniformly at 2.10c., Pittsburgh basis, but the amount of contracting in plates and shapes is negligible. Sheets are slightly weaker in that the maximum prices recently quoted have virtually disappeared except on small lots. The advance on wire nails to $2.95 has not held and sales are being made at $2.85, at which figure most of the trade covered for first quarter.

The scrap market continues weak and there are further declines in prices of some grades.

Pig Iron.—Two soil pipe manufacturers, whose purchases for second quarter totaled 10,000 to 12,000 tons, furnished the most severe test the eastern Pennsylvania pig iron market has had in weeks. The contracts were put through on the basis of $23, furnace, for No. 2 plain, a concession of 50c. a ton, but the furnaces which took the business seem well satisfied that the market held at that figure. Silicon differentials are slightly easier, also, the spread between No. 2 plain and No. 2X now being 50c. in most instances. Competition of foreign iron enters into nearly every transaction, but merchants who are selling foreign iron say that the better foundry grades can not be brought in for less than $22, Philadelphia, and adding the duty of 75c. a ton to this makes it impossible to handle it profitably at less than $23 to $24.50, f.o.b. cars, Philadelphia, the exact price being governed by the grade and the country of origin. Except for one lot of 1000 tons of copper bearing low phosphorus iron, the week's sales are confined mostly to foundry grades. Basic is receiving no attention, but the second quarter inquiry of an Eastern plate manufacturer will probably be out before the end of the month.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rate varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$23.76 to $24.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.26 to 25.13
East. Pa. No. 1X	25.26 to 26.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 29.67
Virginia No. 2X, 2.25 to 2.75 sil.	29.67 to 30.17
Basic delivered eastern Pa.	23.75 to 24.25
Gray forge	23.50 to 24.50
Malleable	24.50 to 25.00
Standard low phos. (f.o.b. furnace)	25.00 to 26.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00

Various grades of foreign pig iron are being offered at approximately the prices quoted below, all quotations being f.o.b. cars, Philadelphia:

Indian foundry iron, 2 to 2.50 per cent sil.	$23.50 to $24.00
Indian foundry iron, 2.25 to 3 per cent sil.	24.00 to 24.50
English foundry iron, 2 to 2.50 per cent sil.	23.00 to 23.50
Continental foundry, 2.50 to 3 per cent sil.	23.00 to 23.50
English low phos., copper free	26.00

Ferroalloys.—Since the price of ferromanganese moved up to $115, furnace or seaboard, a few weeks ago, there have been almost no sales.

Billets.—Nominal prices on billets are $37.50 to $38, Pittsburgh, for rerolling quality and $42.50 to $43, Pittsburgh, for forging quality. There are few sales.

Plates.—Orders for plates were somewhat more plentiful in the past week than in the two or three weeks immediately preceding, but the bulk of current rollings is made up of specifications on contracts. The local locomotive works has received an order for 35 engines from the Atlantic Coast Line. The Reading Railroad is inquiring for six car floats which will take about 1700 tons of plates. The City of Philadelphia is in the market for 10 dump barges which will take 1800 tons of plates. The Newport News Shipbuilding & Dry Dock Co. has received a contract from the District Engineers of Philadelphia for a dredge in which there will be 700 tons of plates. The Merchants' and Miners' Line is getting bids on two boats which will take possibly 2000 tons or more of steel. Current orders are being entered at 2.10c., Pittsburgh, but the usual concessions have been given on car material.

Structural Material.—Fabricators and jobbers are not much concerned over their supply of steel for second quarter, and very little contracting has been done. The mills quote 2.10c., Pittsburgh, for that period, but as fabricators and jobbers are getting ample shipments of shapes bought at 2c. or less, they are not yet ready to entertain the idea of paying a higher price. A number of building jobs are in prospect locally.

Bars.—Second quarter contracting in bars has been going on to a considerable extent, and sellers say that they are having no difficulty in getting 2.10c., Pittsburgh.

Sheets.—Prices show no strength and the minimum quotations of recent weeks are now applicable on a good deal of the current business. These prices are 2.70c. for blue annealed, 3.50c. for black and 4.75c. for galvanized, all base Pittsburgh.

Wire Nails.—Nails are now offered freely at $2.85 per 100-lb. keg, the effort of some mills to obtain $2.95 not having been successful.

Track Material.—Railroads are specifying track material freely, specifications of one Eastern road having been sent out last week for about 300,000 tie plates (1800 tons).

Bolts, Nuts and Rivets.—Eastern makers of bolts, nuts and rivets welcome the change by which they have gone back to a Pittsburgh basing, succeeding the f.o.b. mill basis recently in effect. The same discounts and net prices in effect at mill are now quoted with the full Pittsburgh freight added, this giving the Eastern makers the equivalent of an advance of 15c. or 20c. per 100 lb.

Warehouse Business.—Prices for steel out of stock are unchanged.

Old Material.—A leading Eastern steel producer bought about 20,000 tons of No. 1 heavy melting steel last week at $16, delivered. Other mills are out of the market. The only offers above $16 are from brokers and dealers who will pay $16.50 for material suitable to be placed in storage. This price is also being paid by brokers for material to be shipped on old orders. Prices on nearly all grades are weak, with further declines on some items of 50c. or more per ton.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$16.00 to $16.50
Scrap rails	16.00 to 16.50
Steel rails for rolling	18.50 to 19.00
No. 1 low phos. heavy 0.04 and under	20.00 to 21.00
Couplers and knuckles	20.00 to 21.00
Rolled steel wheels	20.00 to 21.00
Cast-iron car wheels	18.50 to 19.00
No. 1 railroad wrought	19.00 to 19.50
No. 1 yard wrought	17.50 to 18.50
No. 1 forge fire	14.00 to 14.50
Bundled sheets (for steel works)	13.50
Mixed borings and turnings (for blast furnace use)	12.50 to 13.00
Machine shop turnings (for steel works use)	13.50
Machine shop turnings (for rolling mill use)	14.00
Heavy axle turnings (or equivalent)	15.50 to 16.00
Cast borings (for steel works and rolling mill)	14.00 to 14.50
Cast borings (for chemical plants)	18.50 to 19.00
No. 1 cast	18.00 to 18.50
Heavy breakable cast (for steel plants)	16.00 to 16.50
Railroad grate bars	14.00
Stove plate (for steel plant use)	14.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.00 to 16.50
Shafting	22.00 to 23.00
Steel axles	22.00 to 23.00

Imports.—Pig iron brought in last week at Philadelphia amounted only to 1050 tons, of which 1000 tons was from England and 50 tons from Holland. Other imports were 200 tons of muck bar from Sweden, 251 tons of bar iron from France and 726 tons of beams, channels, etc., from Belgium.

GREAT ACHIEVEMENT

Remarkable Record of American Railroads in Overcoming Tremendous Difficulties

Investors both here and abroad, despite the immense difficulties under which American railroads have labored during the past few years, do not seem worried over the future of the carriers or in doubt as to the inherent soundnesss of American railroad securities, says the National Industrial Conference Board. Significant in this respect is the remarkable feat of the New York, New Haven & Hartford Railroad Co. in financing the refunding of its European bonds maturing April 1, without even requiring the aid of an underwriting syndicate, thus saving considerable brokerage on a $23,000,000 issue, although much apprehension has been felt in financial circles as to the road's ability promptly to take care of this obligation. This accomplishment during a period when many carriers have found financing difficult, and on the heels of a most trying period in railroad history, demonstrated that the public is distinctly reassured as to the railroads' ability to work out their problems.

Cold Facts and Figures

Vindication of the investor's confidence in American railroad management can be found in the Research Report of the National Industrial Conference Board on "Railroad Performance," recording in cold facts and figures the remarkable achievements of efficiency and economy of railroad management during the years 1915 and 1923 when, sorely beset by the difficulties of war times, rehabilitation and Government regulation. In many tables, charts and computations of ton-miles, train-miles, passenger-miles, man-hour work and equated traffic units, a graphic record is unfolded of how the carriers coped with the perplexing task of meeting the emergencies and often staggering traffic demands of war and post war years, the period covered by the survey.

Two major problems have been facing the railroads especially during the post war period. The task of handling the ever increasing traffic demands of a growing nation, and the financing of the required improvements and expansion under the handicaps of higher payrolls, higher prices of materials and the restriction placed on earnings under the existing system of Government regulation. The question "will the railroads be able to finance their vast requirements for rehabilitation and expansion," indeed has been the question of the hour, with the alternative of a breakdown of the country's transportation system and its being taken over by the Government.

"It has been generally difficult, if not impossible," the report points out, "for railroad companies faced with the requirement to share their profits with the Government in fat years, and bear their losses alone in lean ones, to maintain a credit which would enable them to finance all the improvements the business of the country demands," and "despite the fact that the transportation act of 1920 provided that the carriers should have rates which would yield a reasonable return on their investments in railroad property, they earned only 3½ per cent in 1921, 4 per cent in 1922 and barely 5 per cent in 1923." Where carriers earn in excess of 6 per cent one-half the surplus goes to the Government.

Results Under Pressure

But necessity is the mother of invention. Under the stress of war emergency, American railroad managers learned many an expedient of efficient operation that the easier pre-war days had failed to evoke. More dexterous handling of rolling stock and freight, more intense utilization of labor and trackage, and the installing of heavier, more powerful locomotives play a large part in the combination of methods by which the roads mastered their problem.

Growing efficiency of operation is apparent in every table and chart of the National Industrial Conference Board's report cited, during the period 1915 to 1923, when the alertness and ingenuity of railroad management was taxed as it never had been before. With the result that in 1923, the report records, the freight traffic carried by the railroads was the heaviest on record, 23 per cent more freight having been handled in that year than in 1915. The significant feature of this achievement, however, is that this was done with an increase of only 13 per cent in freight cars used and with only 4 per cent more freight trains being operated.

Argentina a Heavier Buyer of Iron and Steel in 1924

WASHINGTON, March 10.—Taking 55,388 long tons of iron and steel from the United States during 1924, the Argentine Republic increased its purchases in this respect 1644 gross tons over the 1923 figures, according to the Iron and Steel Division of the Department of Commerce. This represents an advance in Argentina's proportional share of our total exports from 2.6 per cent in 1923 to 3 per cent in 1924.

The bulk of the shipments to Argentina in 1924 were plates and sheets, tubes, pipes and fittings, and wire and manufactures thereof. A total of 24,653 tons of plates and sheets, constituting 44 per cent of the iron and steel exports, were consigned to that country. Of this amount 14,362 tons were galvanized sheets, 8889 tons were tin plate and terne plate, and 1248 tons were black steel sheets. In addition, 308 tons of hoops, bands and scroll and 17 tons of strip steel went forward.

Construction work in the Argentine Republic called for the shipment of 1989 tons of structural shapes, plain material, 255 tons of fabricated structural shapes, 174 tons of ship and tank plates, punched or shaped, 445 tons of metal lath and 994 tons of other structural forms. October was the month of greatest activity in this line, 1180 tons of the foregoing products having left American ports for Argentina during that month.

Steel Man Appointed to Bogota Post

WASHINGTON, March 10.—Appointment of William Boaz of Fort Worth, Tex., as American Commercial Attaché at Bogota, Colombia, has been announced by Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce.

During Mr. Boaz's eight years abroad he was employed for two years as general representative of the Consolidated Steel Corporation in Spain, Portugal, and North Africa, afterwards touring Latin-American countries for that company. Later, he served as engineer in Argentine and Uruguay for the United States Steel Products Co., New York, subsequently being that company's representative in Central America.

Commercial Attaché Boaz received his engineering training at Harvard and is a veteran of the World War. Prior to his military service, he had considerable technical experience with the independent steel companies and the American Bridge Co., and was engineer-in-charge for the Krajewski-Peasant Corporation, a leading Cuban concern.

Offices and salesroom of the Columbus Railway, Power & Light Co., Columbus, Ohio, have been moved from 102 North Third Street to 215 North Front Street. The building at the latter location was purchased by the company several months ago and has been extensively remodeled.

The Gibb Welding Machines Co., successor to Gibb Instrument Co., Bay City, Mich., manufacturer of electric welding equipment, has appointed the Welding Service & Sales Co., Donovan Building, Detroit, T. M. Butler, as agent in the Detroit territory.

The General American Tank Car Corporation moved its general offices from the Harris Trust Building to the Illinois Merchants Bank Building, Chicago, on March 1.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....2c. to 2.10c.
F.o.b. Chicago, base, per lb.....2.30c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.10c.
F.o.b. Chicago, base, per lb.....2.30c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....2.10c.
Soft steel bars f.o.b. Chicago, base, per lb.....2.20c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb....2.10c.
Rail steel bars, f.o.b. Chicago district mills, base, per lb.2.10c.
Common iron bars, f.o.b. Chicago, base, per lb.....2c.
Refined iron bars, f.o.b. P'gh mills, base, per lb..3c. to 3.10c.
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

Hot-Rolled Flats

Hoops, base, per lb., Pittsburgh.....2.40c. to 2.50c.
Bands, base, per lb., Pittsburgh.....2.40c. to 2.50c.
Strips, Pittsburgh .....2.40c. to 2.50c.
Strips, Chicago .....2.55c. to 2.60c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb. 2.70c. to 2.80c.
Screw stock and shafting, f.o.b. Chicago, base, per lb....2.80c.
Screw stock, base, per lb., Cleveland.....2.75c. to 2.85c.
Shafting, ground, f.o.b. mill, base, per lb.....3.20c.
Strips, f.o.b. P'gh mills, base, per lb.....4c. to 4.15c.
Strips, f.o.b. Cleveland mills, base, per lb.....4c. to 4.15c.
Strips, f.o.b. Chicago mills, base, per lb.....4.45c.
Strips, f.o.b. Worcester mills, base, per lb.....4.30c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....$2.85 to $2.95
Galvanized nails, 1-in. and longer, base plus.... 2.25
Galvanized nails, shorter than 1-in., base plus... 2.50
Bright plain wire, base, No. 9 gage, per 100 lb.. 2.60 to 2.70
Annealed fence wire, base, per 100 lb..... 2.75 to 2.85
Galvanized wire, No. 9, base, per 100 lb..... 3.20 to 3.30
Galvanized barbed, base, per 100 lb..... 3.55 to 3.65
Galvanized staples, base, per keg..... 3.55 to 3.65
Painted barbed wire, base, per 100 lb..... 3.30 to 3.40
Polished staples, base, per keg..... 3.30 to 3.40
Cement coated nails, base, per count keg..... 2.15 to 2.25
*Bale ties, carloads to jobbers....75, 15 and 5 per cent off list
*Bale ties, carloads to retailers...75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers. $67.00 to $69.00

Chicago district mill prices are $2 per ton above the foregoing and Chicago delivered prices are $3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices $3 a ton higher; Worcester, Mass., mills $3 a ton higher on production of that plant, and Duluth, Minn., mills $2 a ton higher; Anderson, Ind., $1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed

(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mill.....2.70c.
No. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills..2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill..3.50c to 3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill..3.70c. to 3.80c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.4.65 to 4.75c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill...4.85c. to 4.95c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist mill.3.50c. to 3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.70c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....4.50c. to 4.60c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.90c.

Tine Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills $5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb base	$11.20	20-lb. coating I. C.	$15.50
8-lb. coating I. C.	11.50	25-lb. coating I. C.	17.00
15-lb. coating I. C.	14.35	30-lb. coating I. C.	18.35
		40-lb. coating I. C.	20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb..$2.60
Large, f.o.b. Chicago, base, per 100 lb..... 2.75
Small, f.o.b. Pittsburgh.....70, 10, 5 per cent off list
Small, Cleveland .....70 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....$43.00
Rails, light, billet, base, per lb.....1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.
Spikes, ⅜ in. and larger, base, per 100 lb.....$2.90 to $3.20
Spikes, ½ in. and smaller, base, per 100 lb..... 3.10 to 3.50
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, all sizes, base, per 100 lb..... 3.90 to 4.25
Tie plates, per 100 lb..... 2.35 to 2.50
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3	61	50½
¼ to ⅜	47	30½	¼ to ⅜	+11	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½	60	49½	1 to 1½	30	14

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1½ points, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2½ per cent beyond the above discount.

NOTE—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discount, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	60	3 and 3¼ in.	45
1¼ and 1½ in.	52	3½ and 3¾ in.	47
1¾ in.	36	4 in.	50
2 and 2¼ in.	31	4½ in. and 5 in.	45
2½ and 2¾ in.	39		

Hot-Rolled			
2 and 2¼ in.	34	3¼ and 3½ in.	50
2½ and 2¾ in.	42	4 in.	53
3 in.	48	4½, 5 and 6 in.	48

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....85 to 87 per cent off list
Carbon 0.30 to 0.40 base.....83 to 85 per cent off list
Plus usual differentials and extra for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage	14¼	2¼-in. O.D. 10 gage	18
2-in. O.D. 11 gage	15	3-in. O.D. 7 gage	33
2-in. O.D. 10 gage	16	1½-in. O.D. 9 gage	15
2¼-in. O.D. 12 gage	16	5⅜-in. O.D. 9 gage	50
2¼-in. O.D. 11 gage	17	5½-in. O.D. 9 gage	52

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.65
Old range non-Bessemer, 51½ per cent iron	4.90
Mesabi Bessemer, 55 per cent iron	5.40
Mesabi non-Bessemer, 51½ per cent iron	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	42c.
Manganese ore, ordinary, 48 per cent manganese from the Caucasus	40c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	$8.75 to $9.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f., Atlantic seaboard	18.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	80c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt	$3.50 to $3.75
Foundry coke, f.o.b. Connellsville prompt	4.25 to 5.00
Mine run steam coal, f.o.b. W. Pa. mines	1.50 to 2.00
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Mine run gas coal, f.o.b. W. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines	1.10 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.25 to 1.35

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid	115.00
Ferrosilicon, 50 per cent, delivered	$82.50 to 85.00
Ferrosilicon, 75 per cent	145.00 to 147.50
Ferrotungsten, per lb. contained metal	90c. to 95c.
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....$33.00
Spiegeleisen, domestic, 16 to 19 per cent.....32.00
Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42; 12 per cent, $44.50; electric furnace ferrosilicon, 10 to 11 per cent, $38; furnace with an advance of $1 per unit for material above 10 per cent.
Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	$20.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	21.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton	18.00

Per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$43.00 to $46.00	$40.00 to $43.00
Maryland	48.00 to 50.00	43.00 to 45.00
Ohio	43.00 to 46.00	40.00 to 43.00
Kentucky	43.00 to 45.00	40.00 to 43.00
Illinois	43.00 to 45.00	40.00 to 43.00
Missouri	45.00 to 48.00	38.00 to 43.00
Ground fire clay, per ton		6.50 to 7.50

Silica Brick:	
Pennsylvania	40.00
Chicago	49.00
Birmingham	54.00
Silica clay, per ton	8.00 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)	40.00
Chrome Brick:	
Standard size, per net ton	48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland and Chicago)

Machine bolts, small rolled threads...60 and 10 per cent off list
Machine bolts, all sizes, cut threads
50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads
50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes..50 and 10 per cent off list
Eagle carriage bolts.....65 and 10 per cent off list
Lag bolts.....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ x 4 in.
45, 10 and 5 per cent off list
Larger and longer sizes.....45, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square.....4c. off list
Hot-pressed nuts, blank or tapped, hexagons....4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.4.10c. off list
Bolt ends with hot pressed nuts..50, 10 and 10 per cent off list
Bolt ends with cold pressed nuts...45, 10 and 5 per cent off list
Washers*.....6c. to 5.50c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts.:
⅜ in. and smaller, U. S. S.....80, 10 and 5 per cent off list
⅞ in. and larger, U. S. S.....75, 10 and 5 per cent off list
Small sizes, S. A. E.....80, 10, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75, 10, 10 and 5 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80 and 5 and 2½ per cent off list
Tire bolts.....50, 10 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

	Per 100 Net S. A. E.	Per 100 Net U. S. S.		Per 100 Net S. A. E.	Per 100 Net U. S. S.
¼-in.	$0.44	$0.44	⅝-in.	$2.35	$2.40
5/16-in.	.515	.515	⅞-in.	3.60	3.60
⅜-in.	.62	.66	1-in.	5.55	5.80
7/16-in.	.79	.90	1⅛-in.	8.90	8.90
½-in.	1.01	1.05	1¼-in.	12.60	13.10
9/16-in.	1.38	1.42	1⅜-in.	18.35	18.35
⅝-in.	1.70	1.73	1½-in.	21.00	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws.....80, 10 and 5 per cent off list
Milled standard set screws, case hardened
80 and 10 per cent off list
Milled headless set screws, cut thread..80 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread
8, 10, 10 and 5 per cent off list
Upset hex. cap screws, S. A. E. thread
8, 10, 10 and 5 per cent off list
Upset set screws.....80, 10 and 10 per cent off list
Milled studs.....75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$37.00 to $38.00
Forging billets, ordinary carbon	42.50 to 45.00
Sheet bars	38.00
Slabs	37.00 to 38.00
*Wire rods, common soft, base, No. 5 to ⅜-in.	48.00 to 50.00
Wire rods, common soft, coarser than ⅜-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2.10c.
Skelp, sheared, per lb.	2.10c.
Skelp, universal, per lb.	2.10c.

*Chicago mill base is $50 to $52. Cleveland mill base, $48 to $50.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100*(1½% Nickel, 10 to 20 per cent Carbon)	$3.00 to $3.25
2300 (3½% Nickel)	4.75
2500 (5% Nickel)	6.25 to 6.50
3100 (Nickel Chromium)	3.65
3200 (Nickel Chromium)	5.50
3300 (Nickel Chromium)	7.50 to 7.75
3400 (Nickel Chromium)	6.50 to 6.75
5100 (Chromium Steel)	3.50
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.25
6100 (Chromium Vanadium spring steel)	4.25
9250 (Silicon Manganese spring steel)	3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4c. to 4.25c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E system.

FABRICATED STEEL BUSINESS

Awards and New Inquiries Drop to Low Point of the Year

A sharp falling off in structural steel awards marked the past week, the volume reported totaling about one-half of that of the previous week, or around 18,000 tons. The largest booking was 6000 tons for a mill building for the McKinney Steel Co. Fresh inquiries of less than 14,000 tons also represent a decline. Tonnages of awards and of new projects showed the smallest total reported for any week this year.

Borden Milk Co., Ralph and Gates Avenues, Brooklyn, N. Y., 300 tons, to George A. Just Co.

Baltimore & Ohio Railroad, bridge work, 1000 tons, to American Bridge Co.

Luzerne Gas & Electric Co., Luzerne County, Pa., switching station, 500 tons, to Lehigh Structural Steel Co.

Y. M. C. A., Waterbury, Conn.; Jennison Co., Fitchburg, Mass.; Sullivan Garage, Springfield, Mass.; St. Joseph Novitiate, Framingham, Mass.; Eagle Clubhouse, Lynn, Mass.; St. Anthony Church, Revere, Mass., a total of 315 tons, all to Palmer Steel Co.

Holy Cross Church, Holyoke, Mass., 150 tons, to Palmer Steel Co.

St. Paul's School, Mechanicsville, N. Y., 120 tons, to Palmer Steel Co.

Boston & Albany Station, Springfield, Mass., 2000 tons, to Palmer Steel Co.

General Electric Co., West Lynn, Mass., 150 tons, to American Bridge Co.

West Penn Power Co., Springdale, Pa., turbine supports, 300 tons, to Jones & Laughlin Steel Corporation.

McKinney Steel Co., Cleveland, mill buildings, 6000 tons, to McClintic-Marshall Co.

Iowa Steel & Iron Works erector on Merchants National Bank, Cedar Rapids, Iowa, has sublet plate girders and beam work, 641 tons, to American Bridge Co.; columns, 512 tons, to Bethlehem Steel Co.

Beaumont, Tex., barges, 700 tons, to Iowa Steel & Iron Works.

Waldorf Paper Co., St. Paul, Minn., 500 tons, to St. Paul Foundry Co.

Quigley Building, Salt Lake City, Utah, 800 tons, to E. Burkhardt & Sons.

Santa Fe Building, Albuquerque, New Mexico, 400 tons, to Kansas City Structural Steel Co.

Garage, Sheboygan, Wis., 200 tons, to Worden-Allen Co.

Denfield High School, addition, Duluth, Minn., 199 tons, to National Iron Works.

Zivens Building, Chicago, 150 tons, to Wendnagel & Co.

Inland Steel Co., high line at Indiana Harbor, Ind., 1500 tons, to Worden-Allen Co.; power and boiler house, 700 tons, to Lakeside Bridge & Steel Co.

Kohler Co., Kohler, Wis., 170 tons, to Lakeside Bridge & Steel Co.

Bird & Son, Inc., Norwood, Mass., plant addition, 100 tons, to James H. Tower & Co., Providence, R. I.

Lehigh Portland Cement Co., building at Oglesby, Ill., 100 tons, to Worden-Allen Co.

School, Oklahoma Avenue, Milwaukee, 100 tons, to Worden-Allen Co.

Sunset Masonic Lodge, Orchard and Pico Streets, Los Angeles, 120 tons, to Brombacher Iron Works.

Power house, County Farm, Los Angeles County, Cal., 118 tons; Union Iron Works, low bidder.

Allegheny Steel Co., mill extension, 150 tons, to McClintic-Marshall Co.

Illinois Central, undercrossing at Sixty-seventh Street, Chicago, 267 tons, to American Bridge Co.

Spring Wells, Mich., Mulkey Avenue grade separation, 570 tons, to McClintic-Marshall Co.

Union Trust Co., Warren, Ohio, bank building, 350 tons, to Reliance Structural Steel Co.

Pittsburgh & Lake Erie Railroad, McKees Rocks, Pa., roundhouse, 450 tons, to McClintic-Marshall Co.

Pennsylvania Railroad, Pittsburgh, Twenty-third and Twenty-fourth Street bridges, 350 tons, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Staten Island Edison Co., New York, office building, 200 tons.

S. Mendelsohn, New York, apartment building, Fifty-second Street and East River, 1000 tons.

Public school No. 63, New York, 600 tons.

Dwight P. Robinson & Co., New York, shop for Coney Island & Brooklyn Railroad, 400 tons.

Lycoming County, Pa., highway bridge, 400 tons.

Pennsylvania Railroad, repair work on main line, 550 tons.

Philadelphia Electric Co., Philadelphia, coal handling towers, 250 tons.

Phoenix Utility Co., New York, pipe line, dams and powerhouse in Utah, 450 tons.

Winthrop Mills, Winthrop, Me., 300 tons.

John Hopkins University, Baltimore, nurses' home, 800 tons.

High school, Akron, Ohio, 300 tons.

James Stewart & Co., New York, Fire Underwriters' building, John and Gold Streets, New York, 1800 tons.

Hocking Valley Railroad Co., bridge, 500 tons.

Bryant Heater & Mfg. Co., Cleveland, 150 tons.

Lincoln-Alliance Bank, Rochester, N. Y., 1200 tons, bids taken.

Marygrove College building, Detroit, 1400 tons, bids to be received this week.

Professional office building, Thirteenth and Locust Streets, Philadelphia, 500 tons.

Office building, Seventeenth and Walnut Streets, Philadelphia, 870 tons.

Office building, 1309 Walnut Street, Philadelphia, about 500 tons.

Office building, 1520 Locust Street, Philadelphia, 200 tons.

Fisher Body Corporation, addition, Detroit, 600 tons.

Atchison, Topeka & Santa Fe, signal bridges and cantilever masts, 190 tons.

Buffalo, two marine towers, 410 tons, bids being taken by James Stewart & Co., general contractor, New York.

RAILROAD EQUIPMENT BUYING

Some Improvement Registered—Southern Pacific Asks for 3400 Cars—Locomotives Purchased

Purchases of cars and new inquiries the past week showed a considerable improvement over those of the previous fortnight. The largest inquiry that appeared, and made up the greater part of the week's new business of close to 4000 cars, was from the Southern Pacific for 3400 freight cars. Orders for several hundred cars each from various railroads totaled about 1700. While no new inquiries for locomotives were reported, orders called for 50, included in which were 35 bought by the Atlantic Coast Line from the Baldwin Locomotive Works.

Freight cars on order Feb. 1 by Class I railroads were reported by the American Railway Association at 59,295, compared with 55,684 on Jan. 1, and with 25,390 on Feb. 1, 1924. During January, 12,735 freight cars were placed in service, compared with 16,192 cars in January, 1924. Locomotives placed in service in January numbered 167, compared with 271 a year ago.

The Delaware, Lackawanna & Western is in the market for 300 refrigerator cars.

The New York Central is asking for 300 flat car bodies.

The Quaker City Tank Line has purchased 200 tank cars (the second such purchase in two weeks) from the Standard Tank Car Co.

The Vacuum Oil Co. has purchased four 55-ton steel hopper cars from the American Car & Foundry Co.

The Central Vermont has closed on 32 steel underframes for caboose and refrigerator cars with the American Car & Foundry Co.

The Atlantic Coast Line has ordered 35 locomotives from the Baldwin Locomotive Works.

The Chicago, Rock Island & Pacific has ordered 10 locomotives from the American Locomotive Co., this being an addition to the order for 10 placed two weeks or more ago.

The Central of Georgia has ordered 5 locomotives from the American Locomotive Co.

The Southern Pacific has entered the market for 3400 50-ton freight cars as follows: 2000 single sheathed box, 1000 general service, 200 tank and 200 automobile cars.

The Chicago, Burlington & Quincy has placed 500 mill type gondola cars with the Western Steel Car & Foundry Co.

The Monon has ordered 500 box and 250 hopper cars from the Pullman Car & Mfg. Co.

Swift & Co. have placed 300 refrigerator cars with the Illinois Car & Mfg. Co.

The Rock Island Lines have ordered 5 baggage and mail cars from the Standard Steel Car Co.

The Chicago & Western Indiana is inquiring for 280 underframes.

The Missouri Pacific is inquiring for 2250 underframes for gondola cars and 250 underframes for box cars.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
March	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
4.....	14.75	14.37½	55.12½	9.00	8.75	7.80	7.45
5.....	14.75	14.37½	54.50	9.00	8.75	7.82½	7.47½
6.....	14.75	14.37½	53.75	9.00	8.75	7.82½	7.47½
7.....	14.75	14.37½	....	9.00	8.75	7.85	7.50
9.....	14.75	14.37½	53.45	9.00	8.75	7.85	7.50
10.....	14.62½	14.25	53.37½	9.00	8.75	7.70	7.35

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, March 10.

Most of the markets are decidedly inactive, some to the point of sluggishness. This is true particularly of copper and zinc and prices are lower. Tin has been moderately active at lower prices. The lead market is quiet but steady.

Copper.—The electrolytic copper market has been virtually stagnant the entire week with very little business reported and with the quotation practically unchanged at 14.62½c., delivered up to today. Consumers are pretty well covered through April, at least, and are not anxious buyers. Sellers have been unwilling to reduce prices, so that there has been something of a standoff. Today, however, with prices lower in London quotations here also were adjusted to 14.50c., delivered, at which only a little business was done. It is the opinion of sellers that the market will stabilize soon and consumers will have to purchase before long for the rest of their second quarter needs. Lake copper is quoted at 14.62½c. to 14.75c., delivered.

Tin.—Sales of Straits tin have been of fair proportions. At least 1000 to 1200 tons has been sold during the period covered by this report, with fairly large sales made on March 2 and 3. Consumers have been the heavy buyers and prices have declined quite steadily. On March 4 about 200 tons changed hands, on March 5 about 250 and on March 6 about 300, with probably 200 tons yesterday, the majority in all cases going to consumers. An interesting feature has been the fact that prices were higher in the morning and lower at the end of the day with some pressure to sell. For example, yesterday Straits tin sold from 53.60c. down to 53.30c., New York. Private cables indicate that Straits shipments for March will be about 5000 tons, and it is expected that the visible supply at the end of March will show a decrease. London prices today were about £9 per ton less than a week ago, with spot standard quoted at £242 5s., future standard at £245 15s. and spot Straits at £247 5s., with sales large at 1200 tons. The Singapore price was £249 10s. Spot Straits tin is quoted here at 53.37½c., New York, with light sales for the first time in several days. The quotation was firm at the close. Arrivals thus far this month have been 1475 tons, with 7811 tons reported afloat.

Lead.—Both the leading interests and the independents are practically on a parity at 9c., New York. At St. Louis the quotation is firm at 8.75c., at which level some business is reported. A few distress lots changed hands at lower than these levels during the week, but lots of this nature are believed to have been cleaned up and the market is now firm with a good volume of business reported.

Zinc.—There is almost no active demand from domestic consumers who are buying the little they need on a hand-to-mouth basis. Quotations are therefore largely under the influence of London prices which declined quite sharply today. After advancing to 7.50c., St. Louis, during the week, the market is today down to 7.40c., at which level there were free offerings but only a little business. Exports are out of the question because of the low prices abroad.

Nickel.—Shot and ingot nickel in wholesale lots are quoted at 31c. to 32c. per lb., with electrolytic nickel at 38c.

Antimony.—Chinese metal in wholesale lots for prompt shipment is quoted at 16c. to 16.50c., New York, duty paid, with a moderate business being done. Futures are considerably lower with April deliveries at 14c. to 14.25c. and March shipments from China down to 12.50c. to 12.75c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

Old Metals.—Demand has improved and prices are firm. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	14.00
Copper, heavy and wire	13.00
Copper, light and bottoms	11.50
Heavy machine composition	10.25
Brass, heavy	8.75
Brass, light	7.50
No. 1 red brass or composition turnings	9.75
No. 1 yellow rod brass turnings	9.50
Lead, heavy	7.50
Lead, tea	6.50
Zinc	4.75
Cast aluminum	19.00
Sheet aluminum	19.00

Chicago

MARCH 10.—Zinc and copper have advanced, while tin, lead and antimony have declined. Zinc buyers evidently delayed buying as long as they could and finally were forced to enter the market for their needs. Copper buying, largely for second quarter, was the heaviest in weeks. Lead is fairly steady and there is no longer the general expectation that it is due for still further declines, but buying as yet is limited to nearby deliveries. The weakness in tin comes at a time when sharp advances had been looked for. Little interest is manifested in antimony although the decline in price is attributed to expected shipments now afloat. Among the old metals only grades of tin have declined. We quote, in carload lots: Lake Copper, 14.87½c.; tin, 54.75c.; lead, 8.80c.; zinc, 7.55c.; in less than carload lots, antimony, 18c. On old metals we quote copper wire, crucible shapes and copper clips, 11.75c.; copper bottoms, 9.75c.; red brass, 8.50c.; yellow brass, 7.50c.; lead pipe, 7c.; zinc, 4.25c.; pewter, No. 1, 28c.; tin foil, 35c.; block tin, 42c.; all buying prices for less than carload lots.

Increase in Steel Corporation's Unfilled Orders

Unfilled orders on the books of the United States Steel Corporation as of Feb. 28, aggregated 5,284,771 tons or 247,448 tons more than remained unfilled on Jan. 31. This February increase compares with one of 220,647 tons in January and with one of 784,757 tons in December. A year ago the unfilled business was 4,912,901 tons or 371,870 tons less than for Feb. 28, this year. Following is the unfilled tonnage as reported by months beginning with January, 1923:

	1925	1924	1923
Jan. 31.....	5,037,322	4,798,429	6,910,776
Feb. 28.....	5,284,771	4,912,901	7,282,989
March 31.....	.....	4,782,807	7,403,332
April 30.....	.....	4,208,447	7,288,509
May 31.....	.....	3,628,089	6,981,351
June 30.....	.....	3,262,505	6,386,261
July 31.....	.....	3,187,072	5,910,763
Aug. 31.....	.....	3,289,577	5,414,663
Sept. 30.....	.....	3,473,780	5,035,750
Oct. 31.....	.....	3,525,270	4,672,825
Nov. 30.....	.....	4,031,969	4,268,584
Dec. 31.....	.....	4,816,676	4,445,339

The Jamestown Car Parts Mfg. Co., Jamestown, N. Y., has had preliminary plans prepared for a one or two-story addition, 105 by 220 ft. and will increase facilities for the manufacture of metal parts and metal furniture, and will have capacity for more radiator business. The company states that it does not intend to discontinue the manufacture of radiators as has been reported.

PERSONAL

John Allen Robinson has been appointed superintendent of the Duluth wire mills of the Minnesota Steel Co., succeeding C. F. Blackmer, whose promotion to the position of assistant manager of the Pittsburgh district wire mills of the American Steel & Wire Co. was mentioned in this column last week. Mr. Robinson became connected with DeKalb works of the Steel Corporation subsidiary in 1900 and he joined the wire mill department in 1903. He was made wire mill foreman of the Waukegan works in 1917, and wire mill order clerk at Duluth in 1920. He became assistant superintendent there in 1924.

Bradford H. Whiting, vice-president and general manager Whiting Corporation, Harvey, Ill., and president of its subsidiary, the Grindle Fuel Equipment Co., has resigned these positions, owing to illness. He also has relinquished the directorship in both companies.

W. M. Corse has expanded his consulting engineering business, becoming associated with F. H. Newell and A. B. McDaniel in a company known as the Research Service, Inc., with headquarters in the Investment Building, Washington. The corporation plans to give service in the respective fields, which have been followed by the three members, with particular attention to its acting as agent for industrial and business organizations desiring contacts with Government departments. Mr. Corse, who has had 25 years' experience in the manufacturing and sales developmental sides of the alloy business, is vice-president and general manager of Research Service. Mr. Newell is president and Mr. McDaniel secretary-treasurer.

W. H. J. Fitzgerald, of W. H. J. Fitzgerald & Co., Boston, dealer in machine tools, has been made president and general manager of the Pneumatic Drop Hammer Co., Boston. Edgar Ward is treasurer.

R. J. McSherry has been appointed foundry superintendent of the Oliver Chilled Plow Works, South Bend, Ind. He was formerly associated with the Hillside Fluor Spar Mines, Chicago, and previously was foundry superintendent for the Hercules Corporation, Evansville, Ind.

M. B. MacNeille, chief engineer of the hydraulic department of Fairbanks, Morse & Co. at Three Rivers, Mich., has been promoted to manager of the pump division.

Howard Bateson, Jr., for the past five years identified with the Jones & Laughlin Steel Corporation at Milwaukee, has joined the sales force of Rogers, Brown & Co. at Chicago.

F. A. Schneider has been elected president of the Gartland-Haswell-Rentschler Foundry Co., Dayton, O. He has been the general manager of the company for four years.

J. M. McNeal, England representative for the Landis Machine Co., Waynesboro, Pa., manufacturer of thread-cutting machines, sailed on the Olympic March 7 for London.

J. P. Flippen, with offices at 649 Union Trust Building, Pittsburgh, has been appointed district representative for the Farrel Foundry & Machine Co., Buffalo, to handle sales of Sykes herringbone gears and reduction units in eastern Pennsylvania, eastern Ohio and West Virginia. Robert P. Waller, 916 Little Building, Boston, has been appointed similarly for the territory east of the Connecticut River.

W. C. Davis of the sales department, Ohio Injector Co., Wadsworth, Ohio, has been promoted to assistant sales manager with headquarters at Wadsworth. He went with the company about four years ago, and up to that time was in the mechanical sales department of the B. F. Goodrich Rubber Co., Akron, Ohio.

H. A. Anderson has been appointed chief engineer for the Johnston Mfg. Co., Minneapolis, Minn., builder of oil burning heating apparatus for railroads and industrial plants. He was in the ordnance department, U. S. Army, during the war, and has been with the Mahr Mfg. Co., also of Minneapolis, for several years, the last two as chief engineer.

D. C. Harris, formerly secretary-treasurer of the Mengel Body Co., Louisville, Ky., manufacturer of automobile bodies, has been elected president of the Mercury Body Corporation, Louisville. W. R. Tischendorf becomes vice-president and Donald MacDonald, secretary-treasurer.

Assistant district managers have been placed by the Barber-Greene Co., maker of material handling machines, Aurora, Ill., as follows: H. H. Driver to assist J. A. Gurney in Pittsburgh; Frank S. Howard, Jr., to assist E. D. Cassel in Cleveland, and P. S. Frederick to assist C. B. Gould in Detroit.

W. F. Scully, formerly president of the Advance Furnace & Engineering Co., Springfield, Mass., has rejoined the organization of the Gilbert & Barker Mfg. Co., Springfield, as manager of furnace and factory sales. He was with the latter company from 1910 to 1920, leaving to organize the Advance Furnace & Engineering Co. Patents, patterns, records, etc., of the Advance company have been purchased by the Gilbert & Barker company, which will supply repair parts for Advance company equipment.

Henry W. Standart has been elected president-treasurer of the Northern Engineering Works, Detroit, builder of cranes, hoists, etc., for the current year. William V. Moore is vice-president and Louis H. Olfs, secretary.

Count Droste zu Vischering und Von Padtberg, president of the East European Railway Co., is in New York to establish a purchasing office, which will handle the buying of railroad and shop equipment, electric and agricultural machinery and tools for users in eastern Europe. The company, organized in Germany, will import from the Near Eastern countries of Europe hemp, flax, maize, hides, sugar and tobacco for sale to German consumers and will export to these countries equipment of all kinds. Count Droste is accompanied by Dr. S. Miles Bouton and Dr. F. A. Higgins of the University of Berlin.

A Southern Exposition will be held in the Grand Central Palace, New York, in the two weeks beginning May 11. Its object is to emphasize among other things the mineral and timber resources of the South, the facilities for agriculture, the water power possibilities and the improvements being made in transportation lines and highways. The exposition is being developed by the International Exposition Co., F. W. Payne, Grand Central Palace, president. The president of the exposition itself is William G. Sirrine, Greenville, S. C.

The annual meeting of the Iron and Steel Institute will be held Thursday and Friday, May 7 and 8, at the headquarters of the Institution of Civil Engineers, Great George Street, London, England. The autumn meeting is scheduled for Birmingham, England, Sept. 9, 10 and 11.

A recent extension of the use of carborundum, well known as an abrasive or grinding material, is in the form of a detector unit for reflex and crystal radio sets. The detector unit is of the cartridge type and is fixed and permanent. Sharp tuning, great selectivity and other advantages are claimed by the makers, the Carborundum Co., Niagara Falls, N. Y.

All records of the Struthers Furnace Co., now in receivership, have been moved from the New York offices, which have been closed, to the newly established quarters in the Wick Building at Youngstown of the receiver, H. W. Grant. Plans are being developed for liquidation of the property.

OBITUARY

Arthur B. Farquhar

Arthur B. Farquhar, prominent manufacturer and political economist, died at his home in York, Pa., on the morning of March 5. Member of many important commissions, honorary vice-president of the Chamber of Commerce of the United States, deeply interested and well informed in political economy and conservation, Mr. Farquhar, without wearing the mantle of high political office, was a forceful figure behind many movements of far-reaching effect.

ARTHUR B. FARQUHAR

He was born in Sandy Spring, Md., in 1838, was educated at a select school at Alexandria, Va., and for a short time after managed his father's farm. An interest in mechanics took him to York, where he learned the machinist's trade and became member of a firm from which evolved the A. B. Farquhar Co., Ltd., manufacturer of agricultural implements and machinery. He had been its president since 1889. Having attained manufacturing success in good measure, he turned more attention to political economy, in which he became a proficient and arduous student. He made numerous contributions to trade journals and was author of "Economics and Industrial Delusions"(1891), regarded as an authoritative source on tariff and free coinage, and "The First Million Is the Hardest," an autobiography of a highly interesting life. In this latter work, reminiscing on what the years had taught him, Mr. Farquhar set down these principles:

That it is, as a rule, safe to trust human beings. Comparatively few are unfair, if you are fair yourself.

That troubles and apparent difficulties are but stepping-stones to progress—the most practical way of learning—and, as John Sherman said, "The way to resume is to resume."

That there is nothing that will take the place of work, either to gain success or to gain happiness or to gain both—and I think it is possible to gain both if, in the striving and working for success, the dollar is not put above the man.

That one can and must keep faith with oneself.

That God is not mocked. You cannot break His laws without suffering.

That one's only dangerous enemy is oneself. In the ultimate no one can hurt you but yourself.

That friends are among the greatest assets—and the way to get friends is to be a friend.

That one should never seek anything for which one does not give value. This avoids the disposition to speculate—which is one of the greatest dangers that beset the business man.

Mr. Farquhar was active in public affairs, for he possessed an abiding interest in social welfare. He served as president of the Pennsylvania Conservation Association and held several city commissions. James G. Blaine as Secretary of State sent him abroad as commissioner in the interests of the World's Columbian Exposition at Chicago. As American Industrial Commissioner to France in 1916, as member of the American Peace Congress, as a director of the National Conservation Association, as an official in the Chamber of Commerce, National Implement and Vehicle Association and the National Association of Manufacturers, he rendered services of distinctive merit. He held membership in the American Civic Association, American Academy of Political and Social Science, American Economic Association, Academy of Political Science, National Economic League and in numerous other civic, social and industrial bodies. Besides his wife, Mr. Farquhar leaves three sons, one of whom, Percival Farquhar, of New York, has extensive railroad and power interests in South America.

WILLIAM I. RUSSELL, who founded the *American Metal Market* in 1882, as a weekly trade paper, and who figured prominently in the metal trades in New York for many years, died on March 5 in Fanwood, N. J., at the age of 74. Starting as broker in 1872, he became an active figure in the pig tin market. At one time he was New York agent for the London firm of A. Strauss & Co. About twenty years ago Mr. Russell wrote his autobiography, of which several thousand copies were sold.

CHARLES W. H. BLOOD, vice-president and treasurer of the S. A. Woods Machine Co., South Boston, maker of woodworking machinery, died at his home in Winthrop, Mass., on March 4. Mr. Blood was a native of Kalamazoo, Mich., was graduated from Cornell in the early nineties, and immediately after became associated with the Boston firm.

WILLIAM H. OAKES, founder of the Oakes Co., manufacturer of automobile parts, Indianapolis, died at his home in that city Feb. 24, at the age of 39. The Oakes Co. became a unit of the Martin-Parry Corporation, York, Pa., about a year ago.

Substantial Results Expected from Pan-American Standardization Conference

The organization of some form of a national standardizing body in each of the American Republics was one of the formal proposals of the first official Pan-American Conference on standardization recently held in Lima, Peru, according to a report to the American Engineering Standards Committee by its past chairman, Albert W. Whitney, who served as chairman of the United States Government delegation.

The conference was held coincidently with the Pan-American Scientific Congress and immediately following the centario celebration of Peruvian independence. The thirteen American republics sending officially accredited representatives were as follows: Brazil, Costa Rica, Cuba, Guatemala, Haiti, Mexico, Nicaragua, Panama, Paraguay, Peru, United States, Uruguay, Venezuela.

The report states that:

"The subject of standardization was received with great interest, and there was a general recognition of the important part that it could play in the future development of the Latin American States. Standardization can be used in these countries in three ways, first in expediting and making more efficient their own industrial development, second in improving the effectiveness of their buying, and, third and most important, in the development of better methods for producing and marketing their own raw products. The way in which Oregon secured a market in the East for its apples was essentially a feat of standardization. There are opportunities in the Latin States which can be taken advantage of only by similar methods.

"The tangible and formal results of the conference were the signing of a set of resolutions by the representatives which provided for the development and promotion of standardization work by the various countries, and for the development of such work on an international basis. The relation of such work and its development on an international basis was entrusted to the Inter-American High Commission. Provision was made for holding the next conference, within two or three years, in the United States."

It is believed that the Lima conference and the work of the Inter-American High Commission will bring about a considerable amount of standardization work among the Latin American States at once.

Machinery Markets and News of the Works

SPREADING ACTIVITY

Orders Are in Fair Volume and from Diversity of Sources

Pacific Fruit Express Issues List and Santa Fe Adds Eight Tools to Recent Inquiry

IN some districts, notably Cincinnati, Chicago and Cleveland, fair business marked the week, although no large individual orders were placed. The increasing diversity of the sources of inquiry is the subject of general comment and this undoubtedly may be taken as indicating some spreading industrial activity.

The outstanding list of the week was that of the Pacific Fruit Express for eleven machines for its Pocatello, Idaho, shops.

The Santa Fe is getting figures on eight more machines, which with those published in these columns last week, total 16 now before the trade.

One of the principal buyers has been the General Electric Co., which has ordered equipment for its Schenectady and Philadelphia plants.

Inquiries have been received from Europe and from South America.

New York

NEW YORK, March 10.

THE machine-tool trade entered upon the third month of the year with a considerable volume of business in prospect, but actual buying is still below the point which is considered satisfactory. Hesitancy prevails to a great extent among buyers of all classes of machine-tool equipment. One of the principal buyers is the General Electric Co., which has purchased quite extensively for its new radio department as well as for its Philadelphia plant. The Interborough Rapid Transit Co. has been buying repair tools for shops in New York. The Richmond Light & Railroad Co., Staten Island, has bought a 42-in. car-wheel borer. The Cleveland, Cincinnati, Chicago & St. Louis Railroad bought a 6-ft. radial drill.

The Hisey-Wolf Machine Co., portable electric machine tools, Cincinnati, Ohio, has reduced many sizes of its electric drills from 12½ to 17 per cent. Other price reductions range from 5 to 10 per cent, all effective Feb. 16.

The Long Island Railroad Co., Pennsylvania Terminal, New York will rebuild the section of its repair shops at Morris Park, L. I., destroyed by fire March 2, with loss reported at $500,000, including equipment. The departments damaged included the car wheel shop, electric car repair shop, air brake shop, brass shop and pipe shop.

Mack Trucks, Inc., 25 Broadway, New York, is said to be considering the erection of a new motor truck assembling plant in the vicinity of Mineola, L. I.

The Argentine Department of Navigation and Ports, Buenos Aires, Argentina, is taking bids until May 27 for cranes, hoists and lifts, capstans and electric motors.

The Sun Oil Co., Finance Building, Philadelphia, has plans for a two-story storage and distributing plant on East Avenue, Long Island City, to cost approximately $45,000.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 24 for one water-tube type test boiler for the Brooklyn Navy Yard; for a similar boiler for the Mare Island yard, schedule 3386, and until March 17 for 500 CO_2 or oxygen valves for the Brooklyn yard, schedule 3418.

Motors, electric power equipment, conveying and other machinery will be installed in the three-story laundry, 100 x 200 ft. to be erected on Edgewater Road, New York, by the Fox Square Laundry, care of J. J. Gloster, 110 West Fortieth Street, architect. It is estimated to cost $250,000 with machinery.

The Board of Transportation, 49 Lafayette Street, New York, has awarded a general contract to the A. A. Johnson Corporation, Long Island City, for foundations for the main railroad car repair shops at Coney Island, to cost $579,000; also to J. H. Duncan, Inc., 5718 Second Avenue, Brooklyn, for work in connection with an electrical repair shop at the same yard to cost $192,400.

The Compania Minaro Asarco, a subsidiary of the American Smelting & Refining Co., 120 Broadway, New York, will construct a new ore reduction plant at Parral, near Monterey, Mex., to cost approximately $500,000 with machinery.

An ice-making and refrigerating plant is planned in the new two-story factory to be built at Queens Boulevard and Moore Street, Long Island City, by the Breyer Ice Cream Co., Ninth and Cumberland Streets, Philadelphia, to be 200 x 375 ft., estimated to cost $500,000 with equipment. A contract for the building has been let to the Turner Construction Co., 244 Madison Avenue, New York. H. W. Breyer is president.

Lehmaier, Schwartz & Co., Inc., 215 East Twenty-second Street, New York, manufacturer of tin foil, etc., has acquired the four-story building and vacant land at 511-29 West Twenty-fifth Street, 99 x 350 ft., for a new plant. It is understood that the present works will be removed to this location.

John A. Rossi, 565 East Tremont Avenue, New York, architect, is preparing plans for a two-story automobile service, repair and garage building, 50 x 100 ft., to cost about $60,000 with equipment.

The Ideal Chair Co., 1406 Metropolitan Avenue, Brooklyn, is considering plans for a new factory at Maspeth, L. I., to cost more than $50,000 with equipment. Work will begin in the spring.

Refrigerating machinery, electric and other mechanical equipment will be installed in the proposed public market building to be erected on the Wallabout Market lands, Brooklyn, estimated to cost $5,000,000. The project will be carried out by the Department of Public Markets, Commissioner Edwin J. O'Malley, Municipal Building, New York.

The Marine Department, Division of Navigation and Ports, Buenos Aires, Argentina, is planning the construction of a naval base at Mar del Plata, to include machine and other shops, material-handling and conveying machinery, and other equipment. The project is estimated to cost $1,580,000. Benjamin Thaw, Jr., secretary, American Consulate, Buenos Aires, has information regarding the enterprise.

The Federal Shipbuilding & Dry Dock Co., Kearny, N. J., a subsidiary of the United States Steel Corporation, has acquired adjoining property on the Hackensack River, near the Lincoln Highway, 440 x 940 ft., and will use for extensions.

The National Cold Storage Co., 19 Hudson Street, New York, will make extensions and improvements in its three-story cold storage and refrigerating plant at Jersey City, N. J., to cost approximately $35,000. A. S. Hedman, 112 East Nineteenth Street, New York, is architect.

The City Council, North Wildwood, N. J., is considering the installation of pumping equipment in connection with a proposed sewage disposal plant estimated to cost $250,000, for which it is expected to ask bids in the spring. L. M. Rice, 2310 Central Avenue, is engineer.

The Atlantic Mfg. Co., 50 Nassau Street, Newark, N. J., manufacturer of collapsible metal tubes, will soon take bids for a new one-story plant, 120 x 160 ft., to cost about $35,000. Harry M. Veix, 736 Broad Street, is architect. Oscar Scudhelm is president.

The Kaplan Specialty Corporation, 140 Halsey Street, Newark, manufacturer of automobile tops, etc., has purchased a three-story factory at 31-37 Summer Avenue and will equip for a new plant.

Jerry O'Mahony, 70-78 Boulevard, Bayonne, N. J., manufacturer of wagons and parts, has awarded a general contract to the Wigton-Abbott Corporation, 522 West Twenty-third Street, New York, for a new one-story plant, 200 x 300 ft.

The Crane Market

NEW inquiry for overhead traveling cranes is light, but purchasing continues in fair volume. Considerable interest is evident in locomotive cranes, so that inquiries current should before long develop into a fair amount of business. The largest recent inquiry that has appeared in the New York district for overhead cranes came from the United States Cast Iron Pipe & Foundry Co., Burlington, N. J., and calls for three 5-ton, 50-ft. span, 3-motor overhead cranes for the company's yard; two 5-ton, 50-ft. span, 3-motor cranes for handling hot iron and a 5-ton, 15-ft. span and two 5-ton, 45-ft. span cranes for handling hot pipe and cores. De Nigris Brothers, Barretto Street, New York, are reported about to close on a 5-ton, 30-ft. span electric traveling crane for a stoneyard.

Although it was expected in the Pittsburgh district that the Carnegie Steel Co. would place its orders for cranes for the Homestead and Duquesne works last week, no action has yet been taken. The Carnegie Steel Co. will be a large buyer of cranes during the year. Several will probably be needed for the new open hearth plant being built at Mingo, Ohio. Purchase of the cranes for the new seamless pipe mill of the Pittsburgh Steel Products Co. at Allenport, Pa., is expected soon, but instead of 10 cranes, called for in the original inquiry, only seven will be bought. There is a marked tendency to defer awards of cranes.

In the Boston district the New England Power Co., Worcester, Mass., is about to close on a 35-ton power house crane for a Connecticut plant. It is reported that some of the bids submitted on this inquiry are exceptionally low.

Among recent purchases are:

Acme Steel Co., Riverdale, Ill., a 10-ton, 65-ft. 10-in. span, 3-motor overhead crane and a 25-ton, 65-ft. 10-in. span, 3-motor crane from the Whiting Corporation.

Bethlehem Steel Co., Bethlehem, Pa., a soaking pit crane for the Steelton plant, two ingot handling and two standard cranes for Sparrows Point, Md., plant, from the Alliance Machine Co.

American Rolling Mill Co., two 15-ton mill cranes and a 10-ton soaking pit crane for its Ashland, Ky., plant, from the Morgan Engineering Co.

Southern Pacific Railway, New York, 3 locomotive pile drivers, from the Industrial Works.

General Electric Co., Schenectady, N. Y., seven 2-ton 4-motor wall cranes for West Philadelphia, Pa., from the Chesapeake Iron Works.

Fruit Growers Supply Co., Susanville, Cal., one gasoline driven, ditching and log loading crane with ⅝-cu. yd. shovel, from the American Hoist & Derrick Co.

Philadelphia & Reading Railroad, a 30-ton gantry crane for Philadelphia yards, from Manning, Maxwell & Moore, Inc., Shaw Electric Crane works.

Mohawk Conduit Co., Cohoes, N. Y., a 5-ton, 45-ft. span, 3-motor crane and a 3-ton monorail hoist from the Shepard Electric Crane & Hoist Co.

American Brass Co., Bridgeport, Conn., a 3-ton, 20-ft. span, underhung crane from the Shepard Electric Crane & Hoist Co.

Ellis Motor Car Co., Newark, N. J., a 2-ton, 33-ft. span, single I beam crane from the New Jersey Foundry & Machine Co.

Phoenix Utility Co., New York, a 50-ton stationary electrict hoist reported purchased from the Whiting Corporation.

Mount Vernon Builders Supply Co., Mount Vernon, N. Y., a monorail system equipped with one 2-ton cage control electric hoist, from an unnamed builder.

Chicago

CHICAGO, March 9.

ALTHOUGH there is an absence of large individual orders, machine tool business is steadily expanding and is coming from an increasing diversity of sources. Industrial activity now appears to be definitely on the up grade and this is particularly true of farm equipment manufacturers. Tractor plants are running at capacity and implement makers now fear that they underestimated demand and will be unable to take care of the business offered. Apparently the farmers are now buying in earnest to supply the needs of several years' accumulation.

Additional railroad inquiries have also made their appearance. The Santa Fe has asked for figures on eight items in addition to the eight published in this report a week ago, and the Pacific Fruit Express has put out a list of 11 items for its Pocatello, Idaho, shops. The Interstate Iron & Steel Co. has closed for a 48-in. planer and a 36-in. vertical boring mill.

Atchison, Topeka & Santa Fe List

One No. 50 Heald, or equivalent, grinding machine.
One rip and cut-off saw.
One combination carwheel journal and axle lathe.
One 2-in. Landis, or equivalent, bolt cutter.
One 36-in. Morton, or equivalent, draw cut shaper.
One 16-in. x 6-ft. portable engine lathe.
One portable 250-ton hydraulic crank pin press.
One 1600-lb. steam hammer.

Pacific Fruit Express List

One Pels-type punch and shear.
One band saw.
One "variety" saw with mortising and boring attachments.
One swing cut-off saw.
One 4-sided molder.
One double-end emery grinder.
One grindstone.
One 1½-in. bolt threader.
Two blacksmith forges.
One 25-in. sliding head upright drill.

The Colstock Mfg. Co., manufacturer of automobile supplies, 2853 Montrose Avenue, Chicago, has awarded contract for a one-story factory, 50 x 125 ft., to cost $15,000.

Bernard R. Ringwald & Sons, cabinet manufacturers, 8090 South Chicago Avenue, Chicago, are receiving bids on a second story addition, 50 x 130 ft., to cost $22,000.

The Joslyn Mfg. & Supply Co., 133 West Washington Street, Chicago, will construct a one-story galvanizing plant, 130 x 230 ft., at 1021-29 West Thirty-ninth Street, to cost $125,000.

Gosch Brothers & Sons, 6428 Wentworth Avenue, Chicago, have awarded contracts for a two-story sash and door factory, 125 x 187 ft., to cost $25,000.

The Vulcan Plow Co., Evansville, Ind., has purchased the patent rights and equipment of the South Bend Chilled Plow Co., South Bend, Ind., and will continue the operation of the South Bend plant for two or three months, when the equipment will be moved to Evansville. An addition to the Evansville plant built in 1919 and 1920 will provide ample space for the additional departments.

E. L. White, Council Bluffs, Iowa, has leased the Gering Foundry, Gering, Neb.

The Advance Pattern & Foundry Co., 2734 West Thirty-sixth Place, Chicago, has awarded a general contract to the Lind Construction Co., 6404 South State Street, for a two-story foundry, 125 x 135 ft., to cost approximately $50,000 with equipment. Kocher & Larson, 6405 South Halsted Street, are architects.

The Northern States Power Co., Minneapolis, Minn., is arranging a fund of $7,000,000 for extensions in power plants and system. Robert F. Pack is vice-president and general manager.

The Oil-O-Matic Heating Co., 207 Washington Street, Bloomington, Ill., manufacturer of oil-burning heating apparatus, has awarded a general contract to the Austin Co., 160 North La Salle Street, Chicago, for its proposed one-story plant, to cost $90,000 with machinery. C. W. Williams is manager.

The Board of Education, Culbertson, Neb., plans the installation of manual training equipment in its proposed two-story high school estimated to cost $115,000, for which plans are being drawn by M. L. Evans, Brandes Building, Hastings, Neb., architect.

The Twin City Rapid Transit Co., Minneapolis, is planning the construction of an automobile service, repair and garage building for company trucks and cars, estimated to cost $100,000 with equipment.

The City Council, Winthrop, Minn., has plans under way for extensions and improvements in the municipal light and

power house, to include additional equipment. It is proposed to ask bids in the spring. Toltz, King & Day, Inc., Builders' Exchange Building, St. Paul, Minn., is engineer.

The commanding officer, Rock Island Arsenal, Ill., is asking bids for a quantity of tools and attachments until March 19, under four specifications, known as O-AP 35607-A, O-AP 35608-A, O-AP 35609-A, and O-AP 35610-A, including 50 sets of lathe tools, 100 lathe dogs, 70 clamp lathe dogs, shaper tools, knurling tool holders, boring tool holders, high speed steel cutters, straight shank cutting-off tools, bits, etc.

The Elgin Wind Power & Pump Co., 75 North State Street, Elgin, Ill., has plans for a three-story and basement addition to cost $35,000. A. E. Johnson is company architect. George M. Peck is president.

The Elco Tool & Screw Co., Rockford, Ill., will soon begin the erection of a two-story plant, 60 x 186 ft., to cost approximately $30,000 with equipment. A general building contract has been let.

The Board of Education, Albert Lea, Minn., plans the installation of manual training equipment in its proposed two-story high school on Clark Street, estimated to cost $250,000. Plans are being drawn by Gaarder & Gaarder, Home Investment Building.

Philadelphia

PHILADELPHIA, March 9.

CONTRACT has been let by the Department of Public Works, City Hall, Philadelphia, to the Robbins Contracting Co., Inc., 1137 North Front Street, for a one-story automobile service, repair and garage building for municipal trucks and cars on Wheatsheaf Lane, near Richmond Street, to cost about $55,000.

The Budd Wheel Corporation, Budd Building, Philadelphia, manufacturer of steel automobile wheels, has acquired the plant of the Columbia Motor Co., Detroit, bankrupt, consisting of 23 acres with existing buildings approximating 130,000 sq. ft. of floor space. The new owner is said to be arranging to use the property for a branch plant.

H. Michelsen, 1214 West Huntingdon Street, Philadelphia, is planning to purchase isolated light and power plant units for farm and rural service, and is desirous of getting in touch with manufacturers of such equipment.

In connection with plans for an expenditure of about $400,000, for new equipment, the Street Cleaning Bureau, Public Works Department, City Hall, Philadelphia, is arranging a fund of $171,000, of the amount noted, for repairs and replacements of automobiles and equipment parts.

The Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia, manufacturer of electrical measuring instruments, has asked bids on a general contract for a factory addition to cost $60,000. Morris & Erskine, 1716 Cherry Street, are architects.

Abraham Levy, 1208 Real Estate Trust Building, Philadelphia, architect, is taking bids for a three-story and basement automobile service, repair and garage building, 68 x 150 ft., at Broad and Pine Streets, to cost in excess of $100,000 with equipment.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: (43297) from Snel & Van Tubergen, Nic., Witsenkade 45, Amsterdam, Netherlands, desiring to get in touch with American manufacturers of tin-plate-working machinery, woodworking machinery, dairy and agricultural equipment, winches, pumps, marine motors and other equipment; (43283) from Ivan Bunge, Havre, France, wishing to get in contact with American manufacturers of continuous boring ratchet drills; (43277) from C. Citroen's Ijzerhandel, Nieuwe Heerengracht 141, Amsterdam, Netherlands, desiring to get in touch with American manufacturers of automobile and bicycle equipment and accessories; (43298) from A/S. G. Hartmann, P. O. Box 1, Oslo, Norway, wishing to get in contact with American manufacturers of oil burners for hot-air furnaces, boilers, stoves, etc.; (43282) from Sanchez, Fanjul y Compania, S. en C., Manati, Oriente, Cuba, desiring to get in touch with American manufacturers of bakers' machinery; (43285) from M. Urrea Canadas & Compania, Arenales 277, Avellaneda City, Buenos Aires, Argentina, desiring to get in contact with American manufacturers of tobacco machinery; and (43288) from Gaspar Torres, Gutierrez Zamora 24, Parral, Chihuahua, Mexico, wishing to get in touch with American manufacturers of tin boxes suitable for shoe polishes, also machinery for the manufacture of such containers.

The Ford Motor Co., Detroit, has acquired the plant and property of the Merchant Shipbuilding Co., Chester, Pa., consisting of 50 acres and a number of buildings, and will establish an automobile assembling works. Plans for remodeling existing structures and erection of new buildings are estimated to cost $1,000,000 including machinery. The company abandoned plans for the establishment of such works at Philadelphia, as recently projected, and former property purchases here will be disposed of.

The Freeman Electric Co., 803 East State Street, Trenton, N. J., manufacturer of electrical equipment and supplies, has plans for a two-story addition to cost approximately $40,000 with equipment. J. Osborne Hunt, 219 East Hanover Street, is architect.

The Glassine Co., West Conshohocken, Pa., recently organized under Delaware laws to manufacture glassine and other processed papers, has acquired the local plant of the Diamond State Fiber Co., nad will convert the works to the new line of production. Chester W. Beecher, formerly an official of the Diamond State company, will be president and manager of the new organization; Lawrence W Glass is vice-president and assistant manager, and George T. Fritz, secretary and treasurer.

The American Car & Foundry Co., Berwick, Pa., is said to be arranging to rebuild the portion of its plant, comprising wheel foundry and pattern department, destroyed by fire Feb. 27, with loss approximately $300,000 including equipment. Headquarters are at 165 Broadway, New York.

In connection with yard and building extensions now in progress at Enola, Pa., the Pennsylvania Railroad Co., Broad Street Station, Philadelphia, is considering the construction of an addition to the engine house, with repair facilities. It is said to be arranging for the purchase of equipment for the Altoona, Pa., shops, including a bolt-threading machine.

The Kingsbury Machine Works, Inc., 4320 Tackawanna Street, Philadelphia, has acquired property on John Street, consisting of a building on site 96 x 103 ft., to be used for extensions.

The Giant Portland Cement Co., Egypt, Pa., has work under way on a plant betterment program, including the installation of machinery in the clinker mill and other departments.

New England

BOSTON, March 9.

TRANSACTIONS in machine tools have again become semi-stagnant, the slight improvement noted a week ago having fallen off. New inquiries also have dropped, but dealers have a large number of quotations out, some of which will probably be closed this month. Competition in the machinery trade is keen. To illustrate, a Worcester, manufacturer in the market for a tool received bids from two manufacturers, representing a cut in list prices. New England representatives of these manufacturers submitted bids that were even lower than the manufacturers'. The prospective customer has not purchased, presumably still holding out for lower prices. The General Electric Co.'s plant still has inquires out for tools.

Work has started on a two-story, 50 x 160 ft. paper box manufacturing plant addition for the Cambridge Paper Box Co., Woburn, Mass. Plans are private.

Plans are in progress for the superstructure for a five-story, 50 x 140 ft. addition to the Boys' Trade school, Worcester, Mass. John B. Moss is chairman of the building commission. Lucine W. Briggs, 314 Main Street., Worcester, is the architect.

The Home City Fuel Co., 287 Main Street, Springfield, Mass., contemplates the erection of a coaling plant for which conveying machinery will be required. George P. Carver, 261 Franklin Street, Boston, is the engineer.

Plans are about ready for a turbine building to be erected by the Narragansett Electric Light Co., Providence, R. I. Jenks & Ballou, 10 Weybosset Street, are the engineers.

The George C. Whitney Co., Worcester, Mass., manufacturer of cards and other paper products, has awarded a general contract to the Aberthaw Construction Co., 27 School Street, Boston, for a three-story addition to cost $65,000.

E. Teel & Co., Medford, Mass., manufacturers of truck bodies, are planning the installation of additional tools, forge and other equipment.

Fire, Feb. 26, destroyed the machine and repair shop of the Pocahontas Fuel Co., Long Wharf, Portland, Me., and a portion of the plant of the Portland Machinery Exchange,

adjoining, with total loss of $100,000 including equipment. Rebuilding plans are under consideration.

The Wilcox Novelty Co., Main Street, Athol, Mass., manufacturer of celluloid and composition products, has acquired adjoining property for a proposed three-story addition, 40 x 200 ft., to double, approximately, the present plant.

The Crystal Ice Co., Norwalk, Conn., plans the installation of ice and refrigerating machinery to cost about $75,000, in its new plant, 90 x 200 ft., in course of construction on Butler Street.

The Board of Water Commissioners, Canton, Mass., is considering the installation of a pumping plant for waterworks service. A steel stand pipe will also be built.

The Maine Milling & Mining Co., West Paris, Me., has broken ground for a new feldspar grinding mill. Machinery will be electrically-operated. The plant will cost close to $50,000 with equipment. C. H. Farley and W. W. Mitchell head the company.

The Electric Appliance Co., Waterbury, Conn., has plans for rebuilding the portion of its factory recently destroyed by fire. It will be one-story, 54 x 65 ft. C. Jerome Bailey, Waterbury, is architect.

Pittsburgh

PITTSBURGH, March 9.

MACHINE-TOOL business in this district is still lacking in volume. Recently the trade was disposed to take a cheerful view because inquiries were numerous, but in the past week inquiries have been fewer and only a fair number of sales were made. The first two months of the year, in point of sales, have not been marked by enough activity to sustain the very optimistic expectations of the latter part of last year and while there is no abandonment of the opinion that the year will prove a profitable one, there is growing realization that business will be competitive and that sellers naming the lowest prices on buyers' specifications will get the orders.

Plans are being considered by the Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, for the construction of an addition to its Colfax steam-operated electric power plant, making the fourth unit to be installed, reported to cost in excess of $450,000.

The Board of Education, Johnstown, Pa., plans the installation of manual training equipment in its proposed four-story and basement high school estimated to cost $750,000. J. E. Adams, Nemo Building, is architect.

The Borough Council, Brookville, Pa., has called a special election on March 17 to approve a bond issue of $100,000, the proceeds to be used for the purchase of the local light and power plant of the Solar Electric Co., and for proposed extensions. It will be operated in the future as municipal property.

R. H. Yates, Charleston, W. Va., is organizing a company with capital of $75,000 to construct a brick-manufacturing plant in the vicinity of Princeton, W. Va., estimated to cost $45,000 with machinery.

The Tompkins Fuel Co., Charleston National Bank Building, Charleston, W. Va., has inquiries out for electric-operated pumping equipment and electric motors.

The Corona Coal Co., Hepzibah, W. Va., is considering rebuilding the portion of its tipple destroyed by fire, March 3, with loss reported at $20,000 including equipment.

The Gravely Motor Plow & Cultivator Co., Dunbar W. Va., has tentative plans for the removal of its business to Huntington, W. Va., where it will develop considerable increase in output. B. F. Gravely is president.

John Fischer, 209 West Robinson Street, Pittsburgh, manufacturer of bed-springs, beds, etc., has acquired property on Lockhart Street, Northside, 130 x 150 ft., improved with three buildings, for $55,000, and will remodel for a new plant.

The Reznor Mfg. Co., Mercer, Pa., manufacturer of gas stoves, has work under way on an improvement program, to include the complete electrification of the plant, replacing all steam-operated equipment.

Harry S. Sands, 39 Eleventh Street, Wheeling, W. Va., and associates are considering the installation of electric power and mining machinery on about 2000 acres of coal property in Barbour County, recently acquired.

The Seiberling Rubber Co., New Castle, Pa., is in the market for tire building equipment for its Akron, Ohio, plant.

Milwaukee

MILWAUKEE, March 9.

MACHINE tool trade is still inclined to be sluggish, but bright spots appearing here and there lend encouragement. Inquiry reveals that new buyers are coming into the market, which is broadening in consequence. While some industrial plants report a decline in employment the past month, the foundry and machine shop group has actually made a gain and employment offices comment particularly upon the good demand for skilled help in the metal trades. Molders, machinists and patternmakers are in demand.

The Milwaukee Corrugating Co., Thirty-sixth Avenue and Burnham Street, Milwaukee, has purchased the entire assets of the Cicero-Chicago Corrugating Co. at Cicero, Ill., and will continue its operation as a branch factory. In addition, a Chicago warehouse with 50,000 sq. ft. has been leased at 4650 West Harrison Street, with a branch sales office in charge of W. F. Waller. Some changes will be made in the equipment at Cicero to increase production and broaden the line. The Milwaukee company has a branch factory at Kansas City, Mo., and another at LaCrosse, Wis. The principal products are metal lath, corner bead, casing and base screen, roofing, ceilings, road strips and other sheet metal building materials. Louis Kuehn is president and August J. Luedke, secretary.

The Kerner Incinerator Co., 1029 Chestnut Street, Milwaukee, manufacturer of domestic units for reducing waste, garbage, etc., has purchased a site on East Water Street, near Juneau Avenue, and plans the erection of a new factory, warehouse and office building estimated to cost $100,000. Architectural details are not yet ready. Mackey Wells is president and general manager.

The Harnischfeger Corporation, 3800 National Avenue, Milwaukee, has plans for a one-story brick and steel addition, 60 x 88 ft., to the core room of its electric steel foundry at 871-891 Robinson Avenue, in Bay View, acquired from the former Hercules Steel Castings Co. Other improvements are under way in the foundry proper. O. T. Willms is plant layout engineer.

The Smalley Mfg. Co., Manitowoc, Wis., manufacturer of corn cutters, blowers and other silo-filling machinery, which has been in charge of a creditors' committee for some time past, is resuming production under the management of J. G. Kelley, who was with the concern 23 years but later joined another organization in a similar line. James H. Daggett, vice-president Marshall & Ilsley Bank, Milwaukee, has been elected president, and Alfred Muchin, head of the Manitowoc Iron & Metals Co., a director. Some replacements of obsolete and worn out equipment will be made at once.

The Aasen Corporation of America, Stoughton, Wis., has been incorporated with a capital stock of $62,500 to manufacture surgical and hospital instruments and supplies. The principals are Neils W. Aasen, M. O. Flom, H. E. Hanson and Andrew Himmeland, attorney. Factory space has been leased and purchase of equipment is under way.

The Rhinelander, Wis., Board of Education has awarded contracts amounting to $165,000 for the construction of the first unit of the new junior high and vocational training institute. The general contract was let to W. H. Farley & Co., New Lisbon, Wis. Equipment probably will not be purchased until July or August. The architects are Smith, Reynolds & Brandt, Manitowoc, Wis.

George E. and Arthur J. Gill, 214 West Washington Street, Madison, Wis., let the contract to the Wells Construction Co., 1136 Exchange Building, Minneapolis, Minn., for a full second story, 75 x 265 ft., to their garage and sales-service building at 13-15 South Webster Street, occupied under lease by the Central Garage Co. The additional space will be used partly for machine and repair shop space. In all the work will cost about $50,000. The architects are Claude & Starck, Madison.

The Prescott Machine Designing Co., Menominee, Mich., designer and builder of lumber manufacturing machinery, has been engaged to prepare plans for the new Government saw and planing mill on the Menominee Indian Reservation at Neopit, Shawano County, Wis., to replace the mills which burned last October. The appropriation is $300,000, of which approximately $200,000 will be used for buildings and machinery.

The Milwaukee Ignition Co., Milwaukee, has been incorporated with $65,000 capital stock by William Drahonovsky, N. J. Woodward and J. E. Matteson, 432 Broadway, to manufacture automotive ignition devices and similar specialties. It is planned to engage in production in leased quarters and new and used equipment will be required.

Cleveland

CLEVELAND, March 9.

MACHINE-TOOL business was fair the past week. There was a good volume of orders but practically all were for single machines and came from widely scattered sources. Sales included two large turret lathes and several engine lathes. Used machinery was active. Some machinery is being bought by the tire industry, but the demand from the automobile and accessory manufacturers continues rather slow. A good volume of inquiries for single machines is pending. The New York Central Railroad has revised an inquiry it sent out several months ago for a 100-ton bushing press.

The Seiss Mfg. Co., Toledo, Ohio, manufacturer of automobile accessories, has placed a general contract with J. H. Berkebile & Son, 313 Broadway, Toledo, for a two-story addition, 40 x 60 ft.

The American Radiator Co. contemplates the erection of a 50 x 50 ft. extension to its Springfield, Ohio, plant to be used for a cleaning room.

The Modern Battery Co., 19 St. Clair Street, Toledo, has placed a general contract with Hiram Miller, 93 City Park Avenue, for a one-story addition, 30 x 60 ft.

The city of Martins Ferry, Ohio, is revising sketches for an electric light plant and water works involving an expenditure of $450,000. Plans provide for an electric generating station, two 4,000,000 gal. pumps, new boilers, ash handling and other equipment. Allen Lumbert is city engineer.

The city of Niles, Ohio, has preliminary plans for a light and power house. E. M. Milligan is the city engineer.

The Stevenson Foundry Co., Wellsville, Ohio, contemplates the erection of an addition. T. A. Hibbens is president and general manager.

The city of Lakewood, Ohio, has asked for bids for a garbage incinerator plant with daily capacity of 50 tons. Handling and other equipment will be required .

Equipment will be required for manual training shops in the following Ohio schools for which contracts have been placed or plans prepared: Youngstown, H. F. Kling & Son, architects; New Philadelphia, A. A. Stermer, clerk of the board of education; Bremen, B. S. Miller, clerk of the board of education; Port Washington, Charles Scherer, clerk of the board of education; Toronto, Edward Thayer, president of the board of education.

The Paragon Refining Co., Toledo, Ohio, is contemplating a program of expansion to cost $500,000. Plans include a new cracking plant and subsidiary buildings. Immediate expenditure will be $250,000. Officers are E. W. Edwards, Cincinnati, president; Howard W. Edwards, vice-president; C. J. Leroux, secretary and treasurer, and C. E. Doden, assistant secretary and treasurer.

St. Louis

ST. LOUIS, March 9.

WORK will begin on a one-story plant, 90 x 240 ft., for Kansas City Bolt & Nut Co., 7100 Independence Road, Kansas City, Mo., estimated to cost $23,000. The erection will be carried out by day labor.

A. B. Chance, Jr., Centralia, Mo., and associates are said to have plans for a new one-story foundry to cost approximately $25,000.

The American Oil Pump & Tank Co., 6300 St. John Avenue, Kansas City, Mo., is planning the erection of a one-story and basement building on Independence Road. W. A. Nerrill is general manager.

The Board of Education, Hannibal, Mo., plans the installation of manual training equipment in its proposed two-story and basement high school estimated to cost $200,000, for which bids are being asked on a general contract until March 17. William B. Ittner, Board of Education Building, St. Louis, is architect.

Fire, March 1, destroyed a portion of the oil storage and distributing plant of the Shaffer Oil & Refining Co., Cushing, Okla., with loss estimated at $100,000 including equipment. Rebuilding plans are under consideration.

The Crane Co., 836 South Michigan Avenue, Chicago, has arranged for the erection of a two-story and basement factory and distributing branch at Sixteenth Street and Grand Avenue, Kansas City, Mo., 50 x 115 ft., with foundations to carry six additional floors. It will cost close to $100,000.

The Board of Education, Tulsa, Okla., has awarded contract to A. T. Hingle, Mid-Continent Building, for its proposed two-story and basement manual arts school, 140 x 150 ft., to cost $125,000 with equipment. Leland I. Shumway, New Wright Building, is architect.

The Interior Woodwork Mfg. Co., St. Louis, recently organized, has leased a portion of the building at Clinton and Main Streets, and will establish a general woodworking plant. William J. Burton, 5956-A McPherson Street, is secretary and treasurer.

The Arkansas Light & Power Co., Pine Bluff, Ark., plans the installation of electric-operated pumping equipment in connection with a proposed water plant in the vicinity of Brinkley, Ark., estimated to cost $55,000.

The City Council, Holdenville, Okla., will build a pumping plant in connection with proposed extensions in the municipal waterworks estimated to cost $80,000, in which amount bonds will soon be voted. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., is engineer.

The Board of Education, Augusta, Kan., has plans for a two-story and basement, 48 x 76 ft., manual arts school, for which bids will be asked soon. S. S. Voigt, Bitting Building, Wichita, Kan., is architect.

J. F. Gresley, Gurdon, Ark., has tentative plans for a one-story woodworking plant estimated to cost $27,000 with machinery.

Buffalo

BUFFALO, March 9.

PLANS are being considered by the Gibbs Properties, Inc., 70 Oak Street, Buffalo, for a new factory to manufacture metal products. A list of machinery and tools is being arranged.

The Board of Education, Tonawanda, N. Y., plans the installation of manual training equipment in its proposed three-story high school estimated to cost $450,000, for which a general building contract has been let to Braas Brothers, 11 Whitney Avenue. E. B. Green & Son, 1 Niagara Street, Buffalo, are architects.

The Houde Engineering Corporation, 1392 West Avenue, Buffalo, manufacturer of shock absorbers, has construction in progress on a new plant on East Delavan Avenue estimated to cost $250,000, and will install machinery in about 60 days. The company has acquired the Houdaille Co., an affiliated organization, with headquarters at 1400 West Avenue, in the same line of production, and will consolidate with its business.

The Depew & Lancaster Light, Power & Conduit Co., Lancaster, N. Y., has applied for permission to acquire the Iroquois Utilities Co., operating at Gowanda, Randolph and neighboring sections, and plans for extensions in power substations and transmission lines in this district.

The Oswego Falls Corporation, Fulton, N. Y., manufacturer of pulp and paper products, has plans for two one-story additions to its mill, to cost $160,000 with equipment. The H. K. Ferguson Co., Euclid Avenue, Cleveland, is engineer and will carry out the erection. H. L. Paddock is president.

The General Milling Corporation, 18 Letchworth Street, Buffalo, is considering rebuilding the portion of its five-story grain elevator destroyed by fire, March 4, with loss reported at $90,000 including equipment. Walter J. Mahoney is president. The plant of the Tube Manifold Corporation, on neighboring property, was damaged in the same fire, with loss confined mostly to machinery from water.

The Board of Education, Blasdell, N. Y., plans the installation of manual training equipment in its proposed two-story and basement high school estimated to cost $150,000, for which bids are being asked on a general contract. Frank A. Spangenberg, 250 Delaware Avenue, Buffalo, is architect.

The Hirschmann Ventilator Co., Buffalo, N. Y., has acquired a two-story factory at LeRoy, N. Y., and will install electrically operated machinery for the manufacture of ventilators and auxiliary equipment.

Detroit

DETROIT, March 9.

A PLANT has been established at Ann Arbor, Mich., by the Cook Spring Co., for the manufacture of automobile steel springs. Work is nearing completion on a heat-treating addition. A. J. Donnally is president, and M. E. Donnally, secretary and treasurer.

Plans for a one-story cold storage and refrigerating plant are being considered by the Byron Center Celery Co., Byron Center, Mich., estimated to cost $25,000.

The AC Spark Plug Co., Flint, Mich., has purchased for an addition the largest unit of the local group plant of the Dort Motor Co., approximating 215,000 sq. ft. The Dort

company is liquidating its business and will dispose of the entire plant, which has been inactive for several months.

The Grand Trunk Railway System, 400 East Jefferson Avenue, Detroit, has tentative plans for a new engine house on Western Avenue, Muskegon, Mich., with repair facilities. C. H. Cuddeback, Western Avenue and Eighth Street, Muskegon, is company architect. Work is under way on a new engine house and shops at the Battle Creek yards, to include the installation of a 100,000 gal. steel water tank, the entire project to cost more than $500,000 with machinery.

The Board of Education, Muskegon, Mich., will soon lay foundations for a power plant, to be used in connection with a new senior and junior high school estimated to cost $850,000.

The Brigham & Uldricks Co., Battle Creek, Mich., recently organized with a capital of $125,000 to operate a woodworking plant, has acquired the three-story plant of the Gillis Construction Co., totaling about 21,000 sq. ft. of floor space, and will remodel. R. H. Brigham is president, and L. E. Alderdyce, secretary.

The Buhl-Verville Aircraft Co., Detroit, has been formed to manufacture airplanes and will occupy a portion of the plant of the Buhl Stamping Co., Scotten Street and the Michigan Central Railroad. Work will be concentrated on the manufacture of high speed machines and parts. Lawrence D. Buhl, head of the Buhl Stamping Co., will be president of the new organization; Alfred V. Verville is vice-president; and Neil C. McMath, general manager of the Canadian plant of the Buhl company, will act as general manager for the aircraft concern.

The Square D Co., Detroit, has purchased an addition to its main plant which enlarges the floor space 25 per cent. T. J. Kauffman, general manager, states that increasing business made it necessary to enlarge production facilities and indications are that business during 1925 will exceed that of 1924, which was the best year in the company's history.

Cincinnati

CINCINNATI, March 9.

GRADUAL improvement is noticeable in the local machine-tool market and manufacturers are booking more business than for a number of weeks. Sales of planers have been good. The G. A. Gray Co. sold a 24-in. planer to Dodge Brothers, Detroit, and a smaller planer to the Ohio Brass Co. The Cincinnati Planer Co. sold at 72-in. planer to the Westinghouse Electric & Mfg. Co., Pittsburgh, and a 48-in. planer to the Inland Steel Co. Milling machine manufacturers' sales have also increased in the past ten days. Lathes are commanding a better market and production has speeded up to some extent. Electric tool houses state that conditions remain about the same with production only fair. Several manufacturers report good inquiries from South America and from Europe.

A. F. Parsons and associates, Huntington, W. Va., have purchased the mining plants of the Nagola-Elkhorn Coal Co., at Whitaker, Ky., and Parson, Ky. Improvements are contemplated at both plants.

The Republic Auto Parts Welding Co., Louisville, Ky., will erect a factory at 305-311 College Street, to cost $6,000.

The Gartland-Haswell-Rentschler Foundry Co., Dayton, Ohio, will enlarge its factory and install $100,000 worth of new equipment. The present capacity of the plant will be doubled.

Bids are being received on a general contract by the Shulte Brass Mfg. Co., Norwood, Ohio, manufacturer of plumbers' supplies, for a new plant, 50 x 300 ft. Requirements will include equipment for a brass foundry, machine shop and finishing works. George T. Shulte heads the company.

The Board of Education, Belmont, Ohio, plans the installation of manual training equipment in its proposed high and grade school at Belmont-Junction, estimated to cost $325,000, for which bids will be asked on general contract in about 90 days. E. J. Mounstephen, 7 Dixon Avenue, Oakwood, Dayton, Ohio, is architect.

The Middle States Construction Co., 524 East Hudson Street, Columbus, Ohio, is in the market for a steam shovel, loading machine and conveying equipment. S. O. Rogers is secretary.

Noel & Co., Nashville, Tenn., operating a cold storage and refrigerating plant, contemplate the erection of a new eight-story plant at 607 North Tenth Street, to cost $250,000 with equipment. The Hart-Nevins-Freeland-Roberts, Co., 167 Eighth Avenue, North, is architect and engineer.

The United States Engineer, P. O. Box 72, Louisville, will take bids until March 31 for a quantity of sheet steel piling.

The L. J. Breed Co., James Building, Chattanooga, Tenn., has inquiries out for a 5 to 7-ton gasoline locomotive, 36-in. gage, a steel derrick, about 10 tons capacity, and a quantity of cast iron pipe.

The Athens Stove Works, Inc., Athens, Tenn., has plans for two one-story additions, 80 x 200 ft., and 90 x 200 ft., for which foundations will be laid at once. Foundry equipment, nickeling apparatus, electric motors and other equipment will be installed. R. J. Fisher is president.

The Fairfield Paper Co., Baltimore, Ohio, has awarded a general contract to the H. K. Ferguson Co., Cleveland, for a one-story plant, 50 x 200 ft., with power house, 50 x 52 ft., to cost $110,000 with equipment.

Alexander M. Robinson, Georgetown, Ky., machinery dealer, has inquiries out for a 125-kw. electric generator, direct-connected to gas engine.

South Atlantic States

BALTIMORE, March 9.

THE City Council, Hagerstown, Md., plans the installation of a pumping plant in connection with a proposed waterworks system, using water from the Potomac River, for which a bond issue of $1,500,000 has been approved.

The Standard Gas Equipment Co., Baltimore, manufacturer of gas stoves, etc., has awarded a general contract to Charles L. Stockhausen & Co., Gay and Water Streets, for a one-story addition to its plant at Bayard and Hamburg Streets, to cost approximately $50,000. Parker, Thomas & Rice, Union Trust Building, are architects.

G. Clinton Uhl, Cumberland, Md., and associates are contemplating the erection of a plant on North George Street for the manufacture of cement and concrete blocks, etc.

The director of purchases and sales, Department of Agriculture, Washington, will receive bids until March 20, for two air compressors.

The Maryland Glass Corporation, Emerson Tower Building, Baltimore, has awarded a general contract to the Consolidated Engineering Co., 20 East Franklin Street, for a two-story addition, to cost $50,000 with equipment.

The Carolina Public Service Co., Greenville, S. C., recently organized to consolidate a number of interests in this section, has plans for a one-story ice-manufacturing plant, 75 x 200 ft., with an initial capacity of 100 tons per day. W. R. H. Greene, 35 Warren Street, New York, is architect. The company is operated by Stone & Webster, Inc., 120 Broadway, New York.

Carter's Production Works, P. O. Box 1191, Wilmington, N. C., has inquiries out for a 16-in. crank shaper.

The R. S. Armstrong & Brothers Co., 676 Marietta Street, Atlanta, Ga., has inquiries out for a geared head lathe, Le Blond type, with or without variable speed motor, also for a circular cold saw, rim drive type.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 24 for 9550 lb. steel wool, schedule 3391; for 2800 lb. sheet duraluminum for the Puget Sound yard, schedule 3407; 2900 hickory sledge hammer handles for the Mare Island yard, schedule 3423; 2300 lb. phosphor tin ingot for the Mare Island yard, 448 sheets sheet tin for the Boston yard, 448 sheets sheet tin for the Brooklyn yard, 1344 sheets roofing sheet tin for the Boston yard, and 8848 sheets roofing sheet tin for the Mare Island yard, schedule 3395; until March 17, for a quantity of bolts and nuts, schedule 3394; 1300 scaling hammers for the Hampton Roads yard, schedule 3430, and 8000 lb. ferrosilicon for the Puget Sound yard, schedule 3387.

The South Carolina Gas & Electric Co., Spartanburg, S. C., has plans for an automatic power substation at East Spartanburg, to cost about $750,000 with equipment. It will be operated in conjunction with the new steam-operated power plant of the company now in course of erection at Parr Shoals, S. C. The company is controlled by the W. S. Barstow Management Corporation, 50 Pine Street, New York.

The Keil-Smith Co., Tifton, Ga., is in the market for a quantity of drop forgings. The company is also planning to purchase a number of machine tools and other machine shop equipment.

The Georgia Chair Co., Gainesville, Ga., is said to be considering the erection of a new plant on Railroad Avenue, 50 x 400 ft., to cost $65,000 with equipment. The company is headed by H. L. and J. B. Edmondson.

The Board of Education, Kinston, N. C., plans the installation of manual training equipment in a projected high school to cost $250,000.

The chemical warfare service, Edgewood Arsenal, Md., will take bids until March 16 for 5500 brass elbow nozzles, circular E. A. P. 42; for 5000 brass nozzles, circular E. A. P. 41, and for 5500 rubber flutter valves, circular E. A. P. 43.

The City Council, Salisbury, Md., plans the installation of a pumping plant on property recently acquired on the Salisbury-Ocean City Boulevard, in connection with a proposed water and sewage system estimated to cost $550,000.

The Motor Service Co., Raleigh, N. C., is considering rebuilding the portion of its No. 1 branch works at Salisbury and Davie Streets, recently destroyed by fire, with loss estimated at $50,000 including equipment.

The Buena Granite Co., Inc., 505 Ouray Building, Washington, is planning the installation of a quarrying, grinding and polishing plant at Buena, Va., for a capacity of about 1000 tons of finished material per day. A power house will be constructed.

The general purchasing officer, Panama Canal, Washington, will take bids until March 17 for 186 hoist drills, 6000 ft. insulated copper cable, three chain blocks, 1000 lb. spikes, quantity of sheet brass, steel tubing, monel metal, yellow brass rods, and twelve wood snatch blocks, Panama circular 2376; until March 27 for 200 lb. sheet brass, 5000 lb. copper sheathing, 5000 lb. solder, 5000 lb. finishing nails, 2000 lb. copper nails, 1000 lb. wire staples, 92 tackle blocks, 10 wood snatch blocks, brass bolts, machine bolts and nuts, 100,000 lb. galvanized iron or steel, brass tubing, six 1-ton chain blocks, six 2-ton chain blocks, grindstone frames, lead washers, etc., Panama circular 1659.

The Person County Board of Education, Roxboro, N. C., plans the installation of manual training equipment in its proposed local high school, to be built in four units, estimated to cost $250,000, complete. Northup & O'Brien, Starbuck Building, Winston-Salem, N. C., are architects.

The City Council, Spartanburg, S. C., is taking bids until April 14 for equipment for a water supply system, including power house with generators, turbines, pumping machinery and accessories; steel standpipe; water purification plant. P. H. Norcross, Candler Building, Atlanta, Ga., is consulting engineer. D. W. Hendrix is chairman of the Public Works Commission.

The Norfolk Fruit & Produce Association, Norfolk, Va., is said to be considering plans for a one-story cold storage and refrigerating plant. J. H. Baker is president.

The Town Council, Roseboro, N. C., is taking bids until March 24 for equipment for a waterworks and sewage system, including one 75-gal. per min. deep well pump, belt-driven; one 10-hp. kerosene oil engine, belt-driven and one 100,000-gal. steel tank on 75-ft. tower. The J. B. McCrary Engineering Corporation, Atlanta, Ga., is engineer.

The Gulf States

BIRMINGHAM, March 10.

ERECTION will soon begin on a one-story plant for the Lloyd Metal Co., 1320 Carr Street, Houston, Tex., to cost $25,000. A. Delisle, Freed Building, is architect.

W. M. Waterman, head of the W. M. Waterman Lumber Co., Waskom, Tex., and associates are arranging for the erection of a plant for the manufacture of brick and tile products estimated to cost $20,000 with machinery.

The Chadick-Haves Provision Co., 115 Texas Street, Shreveport, La., has acquired 3 acres in the Augurs section for the construction of a cold storage and refrigerating plant to cost $60,000 with equipment.

The City Council, Hazelhurst, Miss., has authorized plans for a municipal electric light and power plant, using oil-burning equipment, estimated to cost $50,000.

The Ward Heater Co., 1243 South Hope Street, Los Angeles, has tentative plans for a new one and two-story works at San Antonio, Tex., comprising foundry, plating and assembling departments, totalling about 52,000 sq. ft. of floor space, estimated to cost $200,000 with machinery. It is expected to begin work during the summer.

The Phillips Ice & Coal Co., Mexia, Tex., will build a one-story ice-manufacturing plant with capacity of about 35 tons per day estimated to cost $55,000 with equipment.

The Gulf States Portland Cement Co., Demopolis, Ala., is planning the installation of a new kiln at its mill to develop a capacity of 1200 bbl. per day, with considerable auxiliary machinery. The company has work in progress on other extensions.

The Tampa Shipbuilding & Engineering Co., Palmetto Beach, near Tampa, Fla., plans the rebuilding of the portion of its shipyard recently destroyed by fire with loss of about $30,000.

The Humble Pipe Line Co., a subsidiary of the Humble Oil & Refining Co., Humble Building, Houston, Tex., is arranging for an increase in capital from $12,000,000 to $24,000,000, a portion of the proceeds to be used for expansion. The company plans the early construction of a new pipe line in Irion County, about 12 miles.

The City Council, Mexia, Tex., is arranging for the construction of a pumping plant, with electric-operated centrifugal pumping units, for a daily output of 2,000,000 gal., in connection with waterworks extensions. The station will cost approximately $50,000. R. W. Morgan is city manager.

The Houston Car Wheel & Machine Co., White and Spring Streets, Houston, Tex., has preliminary plans for extensions, including a one-story building, 75 x 200 ft., and the installation of an electric furnace, 5 and 10-ton electric traveling cranes, a number of heavy-duty machine tools and auxiliary equipment, estimated to cost $150,000. J. H. Dore is president.

The Board of Education, Harrisburg, Tex., plans the installation of manual training equipment in its proposed high school estimated to cost $200,000, for which bids will soon be asked on a general contract. Louis A. Glover, Binz Building, Houston, Tex., is architect.

The Louisiana Refrigerated Products Co., 2465 Texas Avenue, Shreveport, La., will soon begin the construction of an addition to its No. 2 ice-manufacturing plant, to increase the output by about 40 tons per day. Additional engine and other power equipment will also be installed.

Pacific Coast

SAN FRANCISCO, March 4.

THE Baker Ice Machine Co., 1805 East Seventh Street, Los Angeles, has awarded a general contract to the Austin Co., for a one-story addition, 100 x 104 ft., to cost $23,000.

The Municipal Railway Department, San Francisco, plans the construction of a new car barn with repair department in the Potrero district, estimated to cost $200,000. M. M. O'Shaughnessy is city engineer.

The Portland Electric Power Co., Portland, Ore., plans a two-story addition to its power house on First Street, to cost approximately $30,000.

The Modern Mfg. Co., Everett, Wash., recently organized by L. E. Smith and J. H. Scott, both of Everett, contemplates the establishment of a plant to manufacture mechanical devices for domestic and other service.

The Board of Education, Pasadena, Cal., has asked bids on a general contract for a new vocational school on Lincoln Avenue, estimated to cost $150,000 with equipment. Allison & Allison, 1405 Hibernian Building, Los Angeles, are architects.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has made application to issue bonds for $14,399,000, practically the entire fund to be used for extensions and betterments in power plants and system.

The Utah Power & Light Corporation, Salt Lake City, Utah, has completed the financing of $5,500,000 for its proposed hydroelectric generating plant on the Bear River in the Cutler district, and will begin work soon. The company is operated by the Electric Bond & Share Co., 71 Broadway, New York.

The White Truck Co., Van Ness Avenue, San Francisco, will proceed with the erection of a one-story and basement plant and service works at Mission and Eleventh Streets, estimated to cost $275,000 with equipment, for which a contract recently was let to G. Wagner, Inc., 181 South Park Street. H. H. Gutterson, 526 Powell Street, is architect.

C. F. Braun & Co., Alhambra, Cal., has awarded a general contract to the Union Iron Works, Los Angeles, for a one-story addition to its welding plant, 40 x 120 ft.

The Arrowhead Iron Works, Inc., Kansas City, Mo., manufacturer of steel flooring, stair treads, etc,, is completing arrangements for a branch plant in the vicinity of San Francisco. W. B. LaForce, 420 Bellevue Avenue, Oakland, Cal., will be manager of the new works.

The Board of County Supervisors, Los Angeles, will begin the construction of a new steam-operated power house at the county farm to cost $35,000.

The Clearwater Timber Co., Lewiston, Idaho, now being organized as a subsidiary of the Weyerhouser Timber Corporation, Tacoma, Wash., has plans under way for the erection of a local mill, to cost about $1,500,000 with equipment. A power plant will be erected. Transmission, conveying, hoisting and other machinery will be required at an early date.

Indiana

INDIANAPOLIS, March 9.

CONTRACT has been awarded by the Berryhill Malleable Iron Co., 1215 Powell Street, Indianapolis, to the C. A. Woods Co., Rockford, Ill., for its new foundry on property recently acquired, to be one-story, 120 x 240 ft., estimated to cost $100,000 with equipment. The company was formed a few months ago by local interests headed by John Berryhill, president, and Daniel Woods, vice-president.

Louis Mattrel, Indianapolis, will operate a machine repair and automobile parts shop at 407 East North Street.

The Indiana Power Co., Vincennes, Ind., will issue notes for $330,400, the proceeds to be used for extensions and improvements in its power plant, including the installation of additional equipment.

The Lehman Co. of America, Cannelton, Ind., has plans for a two-story factory for the manufacture of furniture, to be 70 x 340 ft., estimated to cost $200,000 with machinery. The Forest Products Engineering Co., 431 South Dearborn Street, Chicago, is engineer. H. M. Clemens is manager.

The Board of Education, Fort Wayne, Ind., is considering the installation of manual training equipment in the proposed two-story and basement high school on the North Side estimated to cost $700,000. Plans will be drawn by Charles H. Weatherhogg, 250 West Wayne Street, architect.

The Northern Indiana Gas & Electric Co., East Chicago, Ind., is disposing of a preferred stock issue of $1,000,000, a portion of the proceeds to be used for extensions in power plants and system. Samuel Insull is president.

The Terre Haute, Indianapolis & Eastern Railroad Co., Terre Haute, Ind., is said to have preliminary plans for rebuilding its machine shop recently destroyed by fire. G. O. Nicolai is local manager.

The Overland-Fudge Co., Hammond, Ind., local representative for the Overland automobile, has arranged for the erection of a two-story service, repair and garage building, 60 x 125 ft., to cost $60,000 with equipment. J. T. Hutton & Son, Hammond, are architects.

The Rub-Tex Products Co., Indianapolis, manufacturer of battery boxes and kindred products, has leased a portion of the plant of the Premier Motors, Inc., and six acres adjoining, and will remodel for a new works, estimated to cost $75,000. The company operates a branch plant at Newcastle, Ind., and this will be kept in service. E. H. Emrick is president.

The Ingle Coal Co., Petersburg, Ind., is planning the installation of equipment for the development of coal properties in Washington Township, near the city, totaling about 3000 acres.

The Muncie Malleable Foundry Co., Muncie, Ind., will rebuild the portion of its plant destroyed by fire, March 1, with loss reported at $500,000 including equipment. John Malnoski is general manager.

Canada

TORONTO, March 9.

IMPROVED condition in the machine-tool market is indicated by the increased volume of business done in February as compared with that of the previous month. Inquiries are numerous and the outlook for March is much better than that at the beginning of last month. In most cases orders have been confined to single tools with an occasional list appearing for half a dozen machines. A good demand for mining equipment is coming from the province of Manitoba. The automotive industry is again active and steadily regaining the lead as the principal machine tool buyer in this market.

J. Birchall, Queenston Road, St. Catharines, Ont., is in the market for an 18-in. x 8-ft. lathe.

The Town Council, Massueville, Que., is in the market for pumps and engine. Phillias Rivard, St. Aime, County Richelieu, Que., is interested.

Fletcher & Nelson, Listowel, Ont., will build a garage and repair plant and are in the market for tools.

The McTague Inner Tube Co., Valleyfield, Que., is planning for the erection of a factory there. L. P. Godbout is interested.,

Beatty Brothers, Ltd., Fergus, Ont., manufacturer of washing machines, etc., will build additions to its three factories.

The Dominion Glass Co., Hamilton, Ont., is completing the erection of an addition to cost $40,000 and will soon be ready for the installation of machinery.

Trade Changes

The E. C. Church Co., dealer in iron, steel and hardware, has moved from Eddy and Fountain Streets to 134-36 West Exchange Street, Providence, R. I.

The Chicago Pneumatic Tool Co., 6 East Forty-Fourth Street, New York, has appointed the Smith & Woodbury Co., 55 Second Street, Portland, Ore., as distributor of its products in Oregon and Southwest Washington.

The Carpenter Steel Co., Reading, Pa., has moved its office and warehouse in Cleveland to 1515 Hamilton Avenue.

The Electric Arc Cutting & Welding Co., 152-156 Jelliff Avenue, Newark, N. J., has opened a new branch office at Syracuse, N. Y., completely equipped to handle all sales and distribution of welding machines and supplies for the entire State, exclusive of the Metropolitan district. William P. McCarthy has charge at Syracuse.

The Foote Brothers Gear & Machine Co., Chicago, has completed arrangements with Gibbons & Gordon, 532-34 Canal Street, New Orleans, for the distribution of speed reducers and gear products in the territory around New Orleans.

The Yost Mfg. Co., Meadville, Pa., manufacturer of vises, anvils, and gas soldering furnaces, has opened a Chicago office and warehouse at 25 South Jefferson Street, with H. S. Huncke in charge. A complete stock will be maintained beginning March 1.

The Ohio Locomotive Crane Co., has opened a district sales office at 647 Book Building, Detroit. Arnold Walters is district sales manager.

The Alamo Iron Works, San Antonio, Tex., has started construction on a new four-story and basement fire proof warehouse, with floor space of 28,000 sq. ft.

The Youngstown Pressed Steel Co., has moved its New York office from 50 East Forty-Second Street to 501 Fifth Avenue.

The Cincinnati Horse Shoe & Iron Co., Cincinnati, has been purchased by the Phoenix Horse Shoe Co., Chicago. No change in the management of the former concern will be made. It was organized 18 years ago. T. H. Hotchkiss is president and George A. Barren is general manager.

The Hill Clutch Machine & Foundry Co., Cleveland, has appointed T. L. Rose & Son, 901 House Building, as representatives in Pittsburgh and adjacent territory. Mr. Rose has been identified with the power transmission field for over 25 years.

The Carroll & Jamieson Machine Tool Co., Batavia, Ohio, announces that it has purchased patterns, jigs, etc., used in the manufacture of Advance engine lathes, formerly made by the Universal Machinery Co., Milwaukee, and is now in position to supply parts and attachments to owners of Advance lathes.

The E. L. Essley Machinery Co., Chicago, has been appointed as exclusive selling agent throughout the Chicago territory for the full line of high speed riveting hammers made by the High Speed Hammer Co., Rochester, N. Y. A complete stock will be carried in Chicago, with a supplementary stock at Milwaukee.

Offices formerly used by the Fitchburg Machine Co., Main Street, Fitchburg, Mass., maker of lathes, have been taken over by a Boston plumbing and supply house. Part of the manufacturing space of the machine tool plant is to be occupied by an automobile concern.

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STEEL AND INDUSTRIAL STOCK

The range of prices in active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	74½	80⅝	Gulf States Steel	88½	91½
Allis-Chal. pf. ..	105⅛	105⅞	Inland Steel ...	45⅜	46¼
Am. B. S. & Fdy.	99	103¼	Int. Har.	105⅛	107¾
Am. B. S. & F. pf.	110½	110¼	Int. Har. pf....	114	114¾
Am. Can	176¼	185½	Lima Loco.	69	71
Am. Can pf.....	119½	119⅝	Nat.-Acme	5⅜	5¾
Am. Car & Fdy..	209	232¼	Nat. En. & Stm.	31½	34½
Am. C. & F. pf..	124	124½	Nat. En. & S. pf.	83¼	84⅝
Am. Locomotive.	137	144⅞	N. Y. Air Brake	50¼	51½
Am. Loco. pf...	122½	123	Otis Steel	9¾	10
Am. Radiator ..	97	98½	Otis Steel pf....	58½	58½
Am. Steel Fdries.	52¼	54⅞	Pressed Stl. Car	58½	59¾
Am. Stl. Fd. pf..	110½	110¾	Pressed Stl. pf..	86	86
Bald. Loco.	137¼	144¾	Replogle Steel ..	17⅜	19½
Bald. Loco. pf..	114	115	Republic	52½	55
Beth. Steel	45	47⅛	Republic pf.	90⅛	92
Beth. Stl. 7% pf.	96¾	100	Sloss-Sheffield ..	89¾	94
Beth. Stl. 8% pf.	112¾	114	Superior Steel ..	30	31
Br. Em. Steel...	3½	3½	Transue-Wms. ..	28	28
Br. Em. Stl. 1 pf.	31	31	Un. Alloy Steel..	28	36⅞
Br. Em. Stl. 2 pf.	10	10	U. S. Pipe.....	222	244¾
Chic. Pneu. Tool	88	89¼	U. S. Pipe pf...	106¼	108
Colo. Fuel	43⅜	46⅝	U. S. Steel.....	122½	125⅜
Crucible Steel ..	74½	79⅝	U. S. Steel pf...	123	124
Crucible Stl. pf..	95	95⅝	Vanadium Steel..	28¼	30¼
Deere pf.	90⅞	91	Va. I., C. & Coke	75	75
Gen. Electric ..	244¼	262¾	W'house Air Br.	105½	106½
Gt. No. Ore Cert.	37⅛	38⅝	Y'gstown S. & T.	72½	75

Industrial Finance

The St. Louis Screw Co., St. Louis, manufacturer of bar iron, screws, bolts and related products, has issued $400,000 first mortgage 5½ per cent bonds. The adjusted balance sheet shows quick assets of $964,002, with current liabilities of $66,941. Real estate, plants and equipment represent a combined cost of $1,902,844, against which a depreciation reserve of $762,637 has been set up, leaving the book value $1,140,207. The properties are divided into two plants, the north plant and the south plant, and the company intends to concentrate all of its activities at the north plant, which comprises approximately 14 acres, and to dispose of the south plant.

Sale of plant, property and equipment of the Westcott Motor Car Co., Springfield, Ohio, will be held April 4, by an order issued by the Federal District Court at Dayton. Some weeks ago the company was placed in the hands of Joseph M. Rehe, receiver, on the application of creditors.

Plant of the Covert Gear Co., Lockport, N. Y., manufacturer of automobile parts, was sold March 6 in a mortgage foreclosure sale to Alwin A. Gloeztner, formerly president and general manager of the company and later trustee for the receiver. The sale was made by Thomas Penny, Jr., assistant U. S. district attorney, acting as special master for the receiver. The plant sold for $36,000, subject to liens totaling $103,000.

The Chapman Valve Mfg. Co., Indian Orchard, Mass., as of Dec. 31 reported a surplus of $1,109,641, which compares with one of $1,114,090 at the close of 1923. Consequently it may be assumed the company operated at a loss in 1924. It had cash on hand of $195,915, contrasted with $148,648 on Dec. 31, 1923, and owed on account $219,693, as against $245,683 the previous year. Its merchandise inventory at the close of 1924 stood at $916,019; at the close of 1923 it was $879,835.

Operating profits of the Eaton Axle & Spring Co. last year were $195,451, compared with $369,927 in 1923. Its balance sheet shows current assets of $2,498,047 and current liabilities of $554,046.

At the close of 1924 the Columbia Steel Corporation had current assets of $3,915,595, and current liabilities of $2,579,875. After taxes, interest and depreciation, the company showed net income of $295,224, which compares with $676,432 for 1923.

In one of the leanest years ever experienced by the Atlas Tack Corporation, Fair Haven, Mass., it reported net loss of $107,756 for 1924. In 1923 the company finished $555 on the profit side and in 1922, $130,270. In January, this year, net profits of $3,076 were shown, and indications are that February and March profits will be better.

Net income of the Vanadium Corporation of America for 1924 was $730,833 after charges. This compares with $681,424 in 1923. Current assets on Dec. 31, 1924, were $6,343,557 and current liabilities $445,091, leaving working capital more than $1,000,000 in excess of that as of Dec. 31, 1923. Total surplus stood at $1,497,712, against $883,876 for 1923.

The Taylor-Wharton Iron & Steel Co. reported a deficit for 1924 of $143,772, after interest and other charges. Net income in 1923 was $334,241.

Reporting sales of $46,682,621 in 1924, Mack Trucks, Inc., and subsidiaries, showed net profit of $6,220,272, after depreciation and Federal taxes. Sales in 1923 were $43,866,957, which returned net profits of $7,003,665. Surplus after dividends last year, $3,383,868, against $4,425,774 the year before.

Net profits of the American Brake Shoe & Foundry Co. in 1924, after allowances for depreciation and Federal taxes were $2,454,904, compared with $2,727,097 in 1923, $2,120,539 in 1922 and $1,329,371 in 1921. There was carried to the surplus account last year $985,994, contrasted with $1,267,207 in 1923, $832,103 in 1922 and $46,736 in 1921.

Gross billings of the Worthington Pump & Machinery Corporation in 1924 were $16,572,066, against $21,142,264 in 1923, and net operating profit $1,067,195, against $1,597,666. Other income brought net to $1,177,779, after allowing interest and other charges, compared with $1,670,850 in 1923. Last year $1.28 was earned on nearly $13,000,000 common stock; in 1923 there was $5.21. Current assets were placed at $18,437,315 and current liabilities at $1,186,510.

The Midland Steel Products Co., Cleveland, reports net earnings of $1,807,481 during 1924, after taxes, depreciation and interest, or $24.47 a share on 50,000 shares of no par common stock, deducting 8 per cent interest requirements on preferred stock. Net earnings in 1923 were $1,086,395.

The Lake Erie Bolt & Nut Co., Cleveland, reports an operating loss of $165,076 in 1924, and a deficit, after interest and depreciation, of $221,694. Bank loans were reduced during the year from $275,000 to $150,000.

Balance sheet of the C. L. Best Tractor Co. as of Dec. 31, 1924, showed surplus of $698,909. Cash, inventories and receivables totaled $3,234,749.

The Interstate Iron & Steel Co., Chicago, shows net income for 1924 of $431,167, after depreciation, interest and Federal taxes. This is $20.93 a share on preferred stock, on which $19.25 a share in cumulative dividends is in arrears. After preferred dividends there remained $7.19 a share on the $4,000,000 of common stock. This compares with $17.04 a share earned on preferred in 1923.

The Sullivan Machinery Co., Chicago, showed net earnings in 1924 of $1,004,072, compared with $1,843,967 in 1923. After reserves and depreciation there remained $427,049 available for the common stock, equivalent to $2.42 a share, against $1,266,379 in 1923, a rate of $7 a share.

American Steel Foundries Report

President K. P. Lamont of the American Steel Foundries, speaking to stockholders on the yearly report, characterized 1924 as a "fairly good" year, with net profits of $4,787,039, slightly over 60 per cent of those for 1923.

"Tonnage of all kinds of materials produced and shipped in 1924," he said, "was 658,554 compared with 828,701 in 1923, or about 80 per cent, in dollars; gross sales amounted to $46,088,069 compared with $63,591,961, approximately 70 per cent.

"Balance sheet shows further improvement with a ratio of quick assets to liabilities of 7 to 1; working capital of $22,192,263 and surplus of $16,462,413."

Industrial News Notes

The Water Works Supply Co., 208 Sharon Building, San Francisco, and 705 Wright & Callender Building, Los Angeles, Cal., distributor of water power, filtration and sewage equipment, is celebrating the fifteenth anniversary of its founding.

The Miles Machinery Co., 207 Bearinger Building, Saginaw, Mich., has purchased the entire machinery and equipment of the Transport Truck Co.'s plant at Mount Pleasant, Mich, including a large number of milling machines, lathes, drills, motors and other equipment. W. L. Miles heads the company.

The firm of Morrison & Riseman, Buffalo, scrap iron dealers, a partnership formed 25 years ago, has been dissolved.

Mills and properties of the Gatineau and Riordan Paper companies which are to be taken over by the International Paper Co., Pershing Square Building, New York, will be operated by a Canadian subsidiary which, according to present plans, will be organized. To finance the acquisition, the International Paper Co. is considering an increase in common stock of $5,000,000 and a new bond issue of $22,500,000. Part of the proceeds will be used in proposed extensions to the properties.

The Buckwalter Radio Corporation, 2632 Prairie Avenue, Chicago, recently incorporated with $31,000 capital stock, will manufacture radio receiving sets, loops and radio tubes. The company has a plant. Officers are C. J. Buckwalter, president; Ward Perry, vice-president; and Fred Armstrong, secretary-treasurer.

Plans of New Companies

The Pitter Ventilating Fan Co., 77 West Washington Street, Chicago, recently incorporated with $60,000 capital stock, will manufacture an exhaust fan using a patented fan blade composed of three arms with three sets of blades so arranged that each blade comes in contact with a new layer of air. A plant will be leased in Chicago, on the north side. Machinery required will include punch presses, engine lathes, drill presses, a spot welder and air brush enamel equipment. Officers are William F. Rapelje, Sr., president; E. M. Buckley, vice-president, and J. P. Buckley, secretary-treasurer.

The Union Steel Products Co., Albion, Mich., representing an incorporation of $1,000,000, has been organized to acquire the Union Steel Products Co., Ltd., formerly of Albion. The company will manufacture bakery equipment and a general line of wire and iron products including oven racks, refrigerator shelves, kitchen cabinet equipment, windmills and hardware specialties. Construction has just been completed on a new three-story warehouse, and as soon as practicable another plant will be erected. The company plans to expand its lines as soon as possible. George E. Dean is president and general manager; W. Clark Dean, vice-president and production manager; Brokway Dickie, secretary, and Fred Sindecuse, treasurer.

The Heintz Steel & Mfg. Co., Main and Clinton Streets, St. Louis, incorporated with $50,000 capital stock, $40,000 paid in, will manufacture galvanized sheet products, culvert pipe, road strips, various types of tanks, steel forms, grain bins, ash pits, cisterns, wagon tanks and special work. Machinery requirements have been placed, orders let for $20,000 in materials and the company has orders on hand for about 200 tons for steel for road building in Illinois and Missouri. It will be in the market from time to time for light sheet metal from 26 gage to ¼ in. thickness. William Heintz is president and general manager; E. J. Buckley, vice-president; M. L. Knackstedd, secretary, and C. H. Knackstedd, treasurer.

The Cornwall Co., Inc., Jefferson Building, 1015 Chestnut Street, Philadelphia, has been organized as distributor of pressed steel products, holding manufacturing rights on several such products and controlling interest in a plant where these will be made.

The Hedwyn Balancer Corporation, 1708 North Carolina Street, Syracuse, N. Y., has been organized to manufacture balancers for lifting and balancing electric and pneumatic portable tools, fixtures, etc. Manufacturing for the present will be done by the Porter-Cable Machine Co.

Distantone Radios, Inc., Earle and Shiperd Avenues, Lynbrook, L. I., has been organized with $25,000 capital stock to manufacture complete radio outfits.

The R. & H. Platinum Works, 709 Sixth Avenue, New York, has been organized to continue the operations of the Roessler & Hasslacher Chemical Co. Manufacturing will be done along similar lines, gradually branching out into wider fields. F. A. Croselmire is manager.

The A. K. Trout Co., Inc., 342 Madison Avenue, New York, has been organized as manufacturer and importer of metal and hardware specialties. At first it will manufacture a patented brush holder and two other specialties will be put on the market later. Manufacturing will be done by contract. A. K. Trout is president and is interested in securing agencies or selling rights for several hardware specialty lines. The company has a Pacific Coast office at 816 Postal Telegraph Building, San Francisco.

The Ackerman Electrical Supply Co., 325 Scribner Avenue, N. W., Grand Rapids, Mich., incorporated with $100,000 capital stock, will operate a wholesale electrical supply house to serve Grand Rapids and adjacent territory. J. C. Hugge is secretary-treasurer.

The Ketchum Farm Equipment Co. has been organized as successor to Ketchum & Co., Marshalltown, Iowa, wholesale distributor of agricultural implements. The company will have a staff of representatives which will have contact with the retail agricultural implement and hardware leaders of Iowa. E. S. Ketchum heads the company.

The Mapes & Sprowl Steel Co., 227 High Street, Newark, N. J., has been organized to succeed the C. D. Mapes Co. and C. I. Sprowl, the chief factors in the interests concerned becoming the heads of the new organization. The object of the merger was to supply a more varied range of steel products, both from mill and warehouse, including tool and cold drawn steel, cold rolled shafting, drill rods, seamless tubing and strip steel.

The California Vibrolithic Co., representing the American Vibrolithic Co., Des Moines, Iowa, recently organized, has opened offices in the Citizens' National Bank Building, Los Angeles, Cal., and in the Garden City Bank Building, San Jose, Cal., for the sale of Portland cement concrete pavements protected by the Vibrolithic process.

E. R. Davis & Co., 310-12 Main Street, Clarksburg, W. Va., has been organized with $75,000 capital stock, continuing an established organization as wholesalers and retailers of hardware products. Roy R. Horner is president.

The W. R. Hughes Corporation, Trenton, N. J., incorporated with $25,000 capital stock, has purchased a plant and will manufacture bathroom fixtures. Mr. Hughes heads the company.

The Industrial Dryer Corporation, 35 Oliver Street, Stamford, Conn., has been organized with $10,000 capital stock as a reorganization of a manufacturer of dryers and conditioners for industrial use. It will continue along the same lines. Its stock supplies consist of pipe fittings, angles and sheet iron, motors and special electrical apparatus. A. F. Wright is secretary.

The American Plush & Velvet Pressboard Co., 123 Fifth Avenue, New York, incorporated with $60,000 capital stock, is engaged in manufacturing pressing machines and steaming devices.

The Diamond Block Co., St. Paul, Minn., recently organized to manufacture building materials, has begun construction of a plant in which equipment will be installed and ready for operation about April 1. Contracts have been let. Elliott Magraw of Magraw, Kerfoot & Co., Pioneer Building, is one of the principals.

The Johnson Machinery Exchange, 63 Mechanic Street, Newark, N. J., has been organized to purchase and sell new and used power equipment and transmission. Samuel Johnson is one of the heads.

The Hartford Heat Treating Co., Hartford, Conn., has been organized with $10,000 capital stock to operate in carburizing, hardening, annealing and treating steel and other metals. John F. Wade, formerly manager of the heat treating and annealing department of the New Departure Mfg. Co. and the Bristol Brass Co., is manager. Andrew J. Broughel is treasurer.

The Visible Tire Gauge Co., New Haven, Conn., has been organized to manufacture automobile accessories. It has a small plant in which machinery is installed ready for operation. Albert McC. Mathewson, 803 Second National Bank Building, is one of the heads.

The Electrical Supply & Radio Corporation, 17 Warren Street, New York, organized recently, is engaged in manufacturing radio equipment, and has a small plant now in operation.

The State Electric Co., Raleigh, N. C., has been incorporated with $50,000 capital stock to do a general electrical contracting business.

The Standard-Peninsular Brass Works, organized as successor to the Standard Brass Works and Peninsular Brass Works, West Warren and Walton Avenues, Detroit, has been incorporated with $500,000 capital stock, $300,000 paid in. Contracts have been let for building additions consisting of a new foundry and a new office building. The merged interests will manufacture cocks, valves and fittings, cock plates, water heaters, brass parts for automobiles, faucets, spigots and similar products. F. G. Austin is chairman; H. R. Brownell is president; P. E. Welton, vice-president, and C. L. Parsons, secretary-treasurer.

The Lakeview Drop Forge Co., Erie, Pa., recently was incorporated with capital of $30,000, to engage in commercial drop forging. It will not require much new equipment at this time as it has leased the plant of the Lakeside Forge Co., Erie, which is being liquidated. Officers of the new company are E. W. Nick, president; G. C. Miller, secretary-treasurer and W. J. Brenner, superintendent.

The Funk Forging Co., Chicago Heights, Ill., recently incorporated with $50,000 capital stock, has bought the mining tool department of the Funk Brothers Mfg. Co. The incorporators include two of the Funk brothers and five employees of the Funk Brothers Mfg. Co. The new organization will manufacture forgings and stampings and will carry on operations in the same plant as the Funk Brothers Mfg. Co. Officers are F. B. Funk, president; J. T. Powers, vice-president; George F. Funk, secretary.

The Gus Berthold Electric Co., 551 West Monroe Street, Chicago, recently incorporated with $30,000 capital stock, has leased a plant and equipment and is manufacturing switchboards for light and power panel boards, steel cabinets and stage equipment. Officers are G. W. Berthold, president and A. L. Wassergord, secretary.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.65c.
Toe-calk, ½ x ⅜ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.15c.
Squares, flats and hex	4.65c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R. One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.45c. to 4.60c.	.....
Nos. 22 and 24	4.60c. to 4.75c.	5.25c.
No. 26	4.65c. to 4.80c.	5.30c.
No. 28*	4.75c. to 4.90c.	5.40c.
No. 30	4.85c. to 5.10c.	.....

Galvanized

	Per Lb.
No. 14	4.85c. to 5.00c.
No. 16	5.00c. to 5.15c.
Nos. 18 and 20	5.15c. to 5.30c.
Nos. 22 and 24	5.30c. to 5.45c.
No. 26	5.45c. to 5.60c.
No. 28*	5.75c. to 5.90c.
No. 30	6.25c. to 6.40c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Weld	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in Butt...	46	29	½ in. Butt..	4	+19
¾ in. Butt...	51	37	¾ in. Butt..	11	+ 9
1-3 in. Butt..	53	39	1-1½ in. Butt	14	+ 6
2½-6 in. Lap	48	35	2-in. Lap ...	5	+14
7 & 8 in. Lap	44	17	3-6 in. Lap..	11	+ 6
11&12 in. Lap	37	12	7-12 in. Lap.	3	+16

Bolts and Screws

Machine bolts, cut thread, 40 and 10 per cent off list
Carriage bolts, cut thread, 30 and 10 per cent off list
Coach screws, 40 and 10 per cent off list
Wood screws, flat head iron,
72½, 25, 10 and 5 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19⅛c. to 20⅛c.
High brass wire	19⅝c. to 20⅝c.
Brass rods	17⅛c. to 18⅛c.
Brass tube, brazed	27⅛c. to 28⅛c.
Brass tube, seamless	23¾c. to 24¼c.
Copper tube, seamless	24¾c. to 25¾c.

Copper Sheets

Sheet copper, hot rolled, 22½c. to 23½c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Prime	Seconds
IC	$11.25	$8.85	80 lb...	$6.15	$5.90
IX	12.85	10.85	90 lb...	6.30	6.05
IXX	14.40	12.55	100 lb...	6.45	6.20
IXXX	15.75	13.85	IC..	6.65	6.40
IXXXX	17.00	15.05	IX..	7.85	7.60
			IXX..	9.00	8.75
			IXXX..	10.35	10.10
			IXXXX..	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	58c.
Bar	64c. to 66c.

Copper

Lake ingot	16¾c.
Electrolytic	16½c.
Casting	16 c.

Spelter and Sheet Zinc

Western spelter	9¼c.
Sheet zinc, No. 9 base, casks	12c. open 12½c.

Lead and Solder*

American pig lead	10½c. to 11c.
Bar lead	14c.
Solder, ½ and ½ guaranteed	40c.
No. 1 solder	37c.
Refined solder	30½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	23c. to 24c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.

Old Metals

The market is firmer and inquiry more active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.00
Copper, heavy wire	11.50
Copper, light bottoms	10.00
Brass, heavy	7.25
Brass, light	6.00
Heavy machine composition	9.00
No. 1 yellow brass turnings	8.50
No. 1 red brass or composition turnings	8.75
Lead, heavy	7.25
Lead, tea	6.00
Zinc	4.25
Cast aluminum	17.00
Sheet aluminum	17.00